APPENDIX L

Response to Comments

Coeur d' Alene Basin - Remedial Investigation
Draft
Comments by Commenter
Anne Dailey (Jan 17, 2001)

Comment No.	Version	Subsection / Add'l Ref	Doc ID	
*** No Watershed ***				
0-Comment Pertaining to Entire Document				
1285	Draft		11	
Comment Text				**Response Text**
Summary comparison of seeps and adits - include in individual watershed writeups. Hangs out too much in 1 and 7				Though the contribution of metals from seeps and adits to surface water are small in comparison to other sources (e.g., floodplain sediments), more detailed information on seeps and adits has been added to Part 7 and the Big Creek, Canyon Creek, Ninemile Creek, Upper South Fork, South Fork and Pine Creek RI reports for completeness in describing potential sources of metals contamination and consistancy with the FS and Restoration Alternatives Plan (Gearheart et al. 1999).
1-Setting and Methodology				
1286	Draft	1.2.1	12	
Comment Text		P. 1-3		**Response Text**
CdA Basin vs CdA R. Basin - consistency				Text edited for consistency.
1287	Draft	1.2.1	13	
Comment Text		p. 1-3		**Response Text**
Remove "Large"				Text edited.
1288	Draft		14	
Comment Text				**Response Text**
Run spell check on entire Part 1				Spell check run on all text of the RI.
1289	Draft	1.2.4	15	
Comment Text		p. 1-7		**Response Text**
Add lead in paragraph, actions taken described below not sufficient to be protective of HH and Env.				Text added
1290	Draft	1.2.4.3	16	
Comment Text		p. 1-7		**Response Text**
Revegetated - w/exception of grass, other vegetation not successful (no trees lived)				Text modified to reflect comment.
1291	Draft	1.2.4.5	17	
Comment Text		p. 1-9		**Response Text**
Success site - not up to date. IDEQ built part of cutoff wall - has gone beyond the pilot study. Talk to Earl Liverman: "Work ongoing to install cutoff wall----"				Text modified to reflect comment.
1292	Draft	1.2.4.13	18	
Comment Text		p. 1-16		**Response Text**
Confirm to what level the mngt plan has been implemented.				The extent to which the Lake Management Plan has been implemented added to text. Activities previously implemented that are thought to have contributed to improvements in water quality over the past 15 to 20 years (which are in the Lake Management Plan) include: - Placement of mine wastes in settling basins and tailings impoundment's instead of directly discharging them to the river;

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*** No Watershed ***				
1-Setting and Methodology				
				- Installation of sewage treatment technologies to reduce nutrient loading; - Implementation of aggressive sediment runoff controls by the Forest Service; - Cessation of nutrient discharges by the phosphate fertilizer plant; and - Imposition of nearshore erosion controls.
1293	Draft	2.2	19	
Comment Text		p. 2-4		**Response Text**
Last sentence 1st paragraph. Confirm which creek w/in the BHSS we are comparing results to				Text modified to remove reference to the creek.
1294	Draft	2.5	110	
Comment Text		p. 2-15		**Response Text**
2nd paragraph, last sentence. Did Paul write this. If not, does he agree.				Paul Woods wrote essentially this same text in the 1991 - 92 CDA Lake Report. It has been paraphrased correctly in the RI.
1295	Draft	5.2.1	111	
Comment Text		p. 5-5		**Response Text**
1st and 2nd full paragraph. "2%" is accurate. The 0.2 to 0.4 = amt of aerial areas associated with the veins (check Maests report)				Agreed. Maest (2000) states that the 2% refers to increases in the geometric means and the 0 2% and 0.4% refer to "veins and associated areas of elevated metal concentrations in the entire South Fork CdA River basin and Canyon Creek, respectively." This section has been rewritten to summarize details in the Background Technical Memorandum.
1296	Draft	5.2.1	112	
Comment Text		p. 5-9		**Response Text**
last paragraph. Typo, lead, 35.8; Mary---				Background concentrations have been revised and are reported under separate cover in a Technical Memorandum (May 2001). The draft text to which this comment refers has been replaced.
1297	Draft		113	
Comment Text		p. 5-10		**Response Text**
last paragraph. Check the wording for consistency with newest Bkgd Tech Memo. Talk to Ann and Kate.				Background concentrations have been revised and are reported under separate cover in a Technical Memorandum (May 2001). The draft text to which this comment refers has been replaced.
1298	Draft	5.4.1.8.2	114	
Comment Text		p. 5-29		**Response Text**
last paragraph. Beef up the Eric Doyle ref (or eliminate)				Reference eliminated.
1299	Draft	5.4.2.1	115	
Comment Text		p. 5-30		**Response Text**
For several pages. Is redundant with the FS. Pick a place.				The text has been left intact for completeness for readers. A certain amount of redundancy among the related RI/RA/FS documents is necessary to prevent cross referencing that may confuse the readers.

Coeur d' Alene Basin - Remedial Investigation
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Comment No.	Version	Subsection / Add'l Ref	Doc ID	
*** No Watershed ***				
1-Setting and Methodology				
1300	Draft	5.4.2.1	116	
Comment Text		p. 5-31		**Response Text**
Last paragraph. SW streams				Text added to clarify "..any water carrying metals will enter the major surface water streams of the basin"
1301	Draft	5.4.2.1.2	117	
Comment Text		p. 5-31		**Response Text**
2nd paragraph. Rewrite 1st sentence natural variability = uncertainty				Text edited.
1302	Draft	5.4.2.2.3	118	
Comment Text		p. 5-36		**Response Text**
Tie back to earlier discussion which sets in or out from sec. 5 3.2. Be specific either here or in 5.3.2.				Reference to Appendix C, which contains specific data used in the calculations, has been added.
1303	Draft	5.4.3.3.1	119	
Comment Text		p. 5-38		**Response Text**
Seems contradictory to what Don was saying. Not enough recent studies. Rud and Winters. Not done his work right. Don thinks a diverse community does exist. [Talk w/Paul and Eco team] "Sparse benthic"				A diverse community is thought to exist. However, this community is thought to minimally impact benthic fluxes. The last part of the sentence will be removed along with the word "sparse." Section will also be updated using Paul's latest calculations which specify benthic flux as a percentage of the riverine flux.
1304	Draft		120	
Comment Text		Table 5.2-8		**Response Text**
Cataldo				This section revised and the table removed. The detailed discussion on calculation of background concentrations is included in the Background Technical Memorandum (URS May 2001) included in the Administrative Record and as Appendix B to the Ecological Risk Assessment.
5-CSM Unit 4, Coeur d'Alene Lake				
1323	Draft		139	
Comment Text		p. 5-14, 5-15		**Response Text**
1st paragraph. Pedersen/litigation when deposed he acknowledged that there is an oxic layer 0-5 cm. P. 99 line 13-15, p. 105 line 19 - p 106 line 2. Add language				Information from Pedersen deposition added to text on page 5-17.
7-Summary				
1305	Draft	2.1	121	
Comment Text		p. 2-1		**Response Text**
CdA River Basin - check whole Part 7				Text edited for consistency.
1306	Draft	3.2.1	122	
Comment Text		p. 3-3		**Response Text**
Distinguish between Upper Bkgd and Bkgd				Background concentrations have been revised and are reported under separate cover in a Technical Memorandum included as Appendix B to the EcoRA and in the Administrative Record. The draft text to which this comment refers has been replaced.

Coeur d' Alene Basin - Remedial Investigation
Draft
Comments by Commenter
Anne Dailey (Jan 17, 2001)

Comment No.	Version	Subsection / Add'l Ref	Doc ID	
*** No Watershed ***				
7-Summary				
1307	Draft		123	
Comment Text		Table 3.2-1		**Response Text**
Reference c. 95th %. Get better reference. LeJeune and Caceala used baseline. Be careful/specific				See response to Comment #1306.
1308	Draft	4.4.3	124	
Comment Text		p. 4-7		**Response Text**
last sent. Take out "dredging and removal—" Keep source.				Text edited as per comment.
1309	Draft	5.3.5	125	
Comment Text		p. 5-9		**Response Text**
RI conclusion that impacts FS source: dZn is Upper and tPb is Lower. What is found. Need to cut to the chase. Include major conclusions. See summary of the FS for consistency.				Section 5.3.5 rewritten to address commentor's concern.
1310	Draft	5.3.5	126	
Comment Text		p. 5-9		**Response Text**
third paragraph. BHSS 28, 65, 57 Check the % values. Zn should be higher				Section 5.3.5 rewritten to address commentor's concern.
1311	Draft	5.3.8.2.3	127	
Comment Text		p. 5-15		**Response Text**
One thing not mentioned. From Paul. Higher flow conditions, can route through in a few days.				The section rewritten to more succinctly summarize results for the lake. Text added to clearly state that during spring runoff, the plume can route through the lake within a few days.
1312	Draft	5.3.8.3.2	128	
Comment Text		p. 5-17		**Response Text**
3 paragraph. Masses of selected—. Clarify the "background" values were from Horowitz. Confirm Horowitz data ref. source for bkgd.				The section rewritten to more succinctly summarize results for the lake; therefore the text to which this comment pertains has been deleted. The more detailed discussion still appears in the CDA Lake report. Horowitz 1993 or 1995 could be used as the reference. The earlier document (1993) is a USGS open file report and the later is a journal publication based on the open file report. The 1993 document is more often quoted which makes the 1995 citation stand out.
1313	Draft	5.3.8.4	129	
Comment Text		p. 5-18		**Response Text**
last sen. Paul concludes that most readsorbs, very unlikely transported to the River. Current conditions at lake = oligotrophic = oxidized				The section rewritten to more succinctly summarize results for the lake; therefore the text to which this comment pertains has been deleted. The revised text contains a discussion on the results of the benthic flux studies.
1314	Draft	5.3.8.5.2	130	
Comment Text		p. 5-19		**Response Text**
3rd paragraph. See comment #29 add text				See response to Comment #1313.
1315	Draft	5.3.8.8	131	
Comment Text		p. 5-24		**Response Text**
Thehigh flow routing time is 1 month during snowmelt. Comment #27 confirm with Paul specific stats for flow and routing time.				See response to Comment #1311.

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Comment No.	Version	Subsection / Add'l Ref	Doc ID	
*** No Watershed ***				
7-Summary				
1316	Draft	5.3.8.9	132	
Comment Text		p. 5-25		**Response Text**
Build in discussion fate of fluxed materials Comment #29				See response to Comment #1313.
1317	Draft		133	
Comment Text		Fig. 5.3.5-6		**Response Text**
Label Rose Lake				Label added.
1318	Draft		134	
Comment Text		Fig. 5.3.5-9		**Response Text**
Label Rose Lake				Label added.
1319	Draft		135	
Comment Text		Fig. 5.3.5-10		**Response Text**
Explain small data set SW and the apparent loading				The number of samples collected for surface water at specific locations on the Spokane River varied from 7 to 13. This small number of samples results in greater uncertainty in the estimated metal concentrations and discharges as indicated by high coefficients of variation. Therefore, for example, discharges and loads at successive downstream locations do not change as would be anticipated. The uncertainty associated with the Spokane River surface water data set is described in the Spokane River RI report.
1320	Draft		136	
Comment Text		Table 5.3.6-1		**Response Text**
Retitle - better description percentage of what total vs diss				Title corrected as follows: "Estimated Dissolved Cadmium, Lead, and Zinc as a Percentage of the Total Metal Concentration". Note these results are from the MIT diffuse layer model, not the probabilistic model developed for this RI (see Part 1, Section 5).
1321	Draft		137	
Comment Text		Attachment 1		**Response Text**
Adit and seep data - Add these data and conclusions fraction of overall loading.				Text and table added with summary of adit/seep concentration and discharge data.
1322	Draft		138	
Comment Text				**Response Text**
Great job of addressing comments on Prelim Draft				Comment noted.

Coeur d' Alene Basin - Remedial Investigation
Draft
Comments by Commenter
Art Bookstrom

Comment No.	Version	Subsection / Add'l Ref	Doc ID

*** No Watershed ***

1-Setting and Methodology

2274	Draft	2.4	171

Comment Text

I had trouble with this section. It isn't really wrong, but it just isn't written very clearly. The first paragraph has many sentences in which plural subjects have singular verbs.

The history of Glacial Lake Coeur d'Alene is interesting, but doesn't seem very relevant unless it is more effectively tied into the present configuration of the valley fill, which is extensively blanketed by relatively thin deposits of metal-enriched sediment, derived from mining. If included, the history of Glacial Lake CdA should explain not only why the valley bottom is wide and relatively flat, but it also should give a general summary of the statigraphy of the unconsolidated sediment that partially fills the bedrock valley.

Basal alluvium is overlain by relatively thick accumulations of Glacial-lake sediments. These are overlain by post-glacial alluvium, which is overlain by relatively thin accumulations of metal-enriched sediment, deposited since mining and milling began in the CdA mining district (This is important, because the thick section of underlying unconsolidated sediment is a possible local source of clean capping material.).

The river meanders along a levee ridge, which is an elevated strip of land, produced by the building-up of the streambed and its natural levees. Natural levees, or spill banks, are low ridges of sediment, built by a stream along both of its banks and onto its floodplain. Natural levees are built up during floods, as water overflows onto the floodplain, spreads, slows, and deposits the coarsest fraction of its load nearest the river.

Lateral lakes and marshes form where water stands in low areas, behind the levees, or between the built-up levee ridge and bedrock hills along the outer margins of the floodplain. Many of the lateral lakes and marshes occupy the mouths of tributary valleys, where they enter the main valley bottom. Most lateral lakes are connected to the river by one or more distributary stream channels or artificial canals. Lateral lakes and marshes are typical of the lower parts of perennial alluvial systems. However, they are unusual in mountainous regions, where river gradients commonly are steep, except where they are graded to a local base level, such as Coeur d'Alene Lake.

Meanders of the CdA River are not very active down-river from Cataldo Flats, where riverbanks and levees of the pre-mining era are composed of cohesive clayey silt. Overlying bank-wedge deposits of metal-enriched sediment generally thicken toward the river and thin toward the levee top. They consist of inter-layered silt and sand, more-or-less cemented by reddish iron oxides. Above the 1980 Mt. St. Helens volcanic ash layer, sandy metal-enriched sediment typically consists of unconsolidated sand

Thickness (not depth) of contaminated sediment is greatest in the river channel, and generally decreases with increasing lateral distance from the river.

In comments about loading, I take it you are talking about Zn transport in dissolved load. If so, you need to say so. Your comments don't fit for Pb transport in suspended sediment.

Concentrations of dissolved metals in the CdA River also are much lower now than they were before operation of the Bunker Hill water treatment plant

Response Text

Text edited for clarity.

Coeur d' Alene Basin - Remedial Investigation
Draft
Comments by Commenter
Art Bookstrom

Comment No.	Version	Subsection / Add'l Ref	Doc ID

*** No Watershed ***

1-Setting and Methodology

2275 Draft — 3.2.4 — 172

Comment Text

Structural Geology: Ore deposits do not occur along the Osburn Fault. The Osburn Fault is a barren, post-ore fault, which displaces the veins that are present north and south of it. The veins on the north side of the Osburn Fault have been displaced about 16 mi eastward, relative to the veins on its south side.

Response Text

The sentence has been deleted from the text

2276 Draft — 3.2.5.1 — 173

Comment Text

Steep Hillside Soils: Volcanic ash is an insignificant component of steep hillside soils. We find the St. Helens Ash only in depositional areas. It was very quickly eroded from steep hillsides. Colluvium and soil form by mechanical and chemical weathering of bedrock, and interaction with organic debris. Colluvium and soil move down-slope by mass wasting and erosion, and therefore generally thicken down-slope. Therefore, lower slopes of hills around the CdA River valley commonly are covered by thick colluvium. Your cobbly/gravely loam, which extends to bedrock, probably is colluvium. Eroded colluvium and soil are transported and re-deposited by moving water to alluvial deposits in valley bottoms.

Response Text

The sentence has been modified to correctly identify the soils as colluvial and derived from bedrock

2277 Draft — 3.2.5.3 — 174

Comment Text

Section 3.2.5 3. Valley Soils: This section describes unconsolidated sediment, not soil. Thickness of unconsolidated sediment in the CdA River valley varies from 30 to 400 ft. Soil is present near the surface, where plants interact with sediment to form soil.

The statement "Included with the Quaternary alluvium are tailings and related materials. . ." is misleading. Tailings and tailings-bearing sediment of the mining era overlie Quaternary alluvium of the pre-mining era.

Response Text

Text modified as per comment.

2278 Draft — 3.2.6.1 — 175

Comment Text

Origin of Ore Deposits: I suggest you omit this topic, which is contentious, and irrelevant to your Remedial Investigation. You have not and can not adequately summarize what is known and not known about the origin of the CdA ore deposits in a short paragraph.

Response Text

The section is retained but has been rewritten

2279 Draft — 3.2.6.2 — 176

Comment Text

Production Figures: You should use the more up-to-date production data compiled by Keith Long (USGS Open-File Report 98-595). Those data are cited in the Feasibility Study Report (Part III of this series), where the full reference citation is available.

Response Text

Text modified for consistency with the FS.

2280 Draft — 3.2.6.3 — 177

Comment Text

Veins: "Ore shoots. . . range in length from a few tens of feet to over 4,000 ft." In what direction? I would move the last sentence of paragraph 2 forward to your description of vein dimensions, which should precede more specific descriptions of vein mineralogy. You should also point out that many of the ore shoots plunge steeply, and many of them extend to great depth.

Galena: It might be better to just say that some galena contains economically important amounts of silver. I don't think you should go into it, because it is not well described in the literature, and it's not really relevant here, but silver in galena does not all substitute for lead in the crystal lattice. Some is in microscopic bodies of tetrahedrite and (or) related sulfosalt minerals, which can be interpreted as microscopic exsolution lamellae, inclusions, and (or) micro-veinlets

Response Text

Clarification regarding ore shoots and silver in galena has been added to the text

Coeur d' Alene Basin - Remedial Investigation
Draft
Comments by Commenter
Art Bookstrom

Comment No.	Version	Subsection / Add'l Ref	Doc ID
* No Watershed *			

1-Setting and Methodology

2281 Draft — 3.2.6.4 — 178

Comment Text

Deposit types: There is a fourth category - 4. tetrahedrite, or silver-copper veins of the Silver Belt. These are hosted in the Revette and St. Regis Formations, and are particularly important for silver. Veins of the, Galena, and Coeur mines are important examples.

Response Text

The paragraph has been modified to reflect the meaning of the original citation (Bennett and Venkatakrishnan, 1982)

2282 Draft — 3.4.1.3.2 — 179

Comment Text

Alluvial Aquifer Systems: Lithology means rock type. You are describing unconsolidated alluvial sediment, which is not rock, because it is not lithified. You should call it Unconsolidated Sediment, or Alluvium.

Response Text

Text modified.

7-Summary

2283 Draft — 1.0 — 1710

Comment Text — paragraph 2

"An estimated 70 million tons of tailings. . ." Again, you should use the more thorough and up-to-date estimate of Long (1998), which is cited in the FS. His estimate is 56 million metric tons (or 61.7 short tons). Also, somewhere near the beginning of the paper, you should tell us you are using short tons (rather than long tons or metric tons).

Response Text

Text updated to be consistent with Part 1, the FS, and the Ecological Risk Assessment.

2284 Draft — 3.2 — 1711

Comment Text — Table 3.2-1

Soil and unconsolidated sediment are not clearly or consistently defined or distinguished in the text, but they are listed separately here. You should define these terms, and use them consistently. I would also like to know why for some elements there are big differences in screening levels for soil versus sediment.

Response Text

Part 1: Soil and sediment definitions added to the glossary. For the RI, soil is considered solid material located in upland areas, while sediment is considered solid material in the floodplain.

Part 2, Screening Level Comment Response: See Part 1 Section 5.1 and associated tables for the source of the screening levels selected. In general, differences in screening levels for soil and sediment are due to different exposure endpoints. Exposure endpoints for risk-based soil screening levels are a mix of human health and ecological receptors while the exposure endpoint for sediment is aquatic life.

2285 Draft — 4.0 — 1712

Comment Text — paragraph 1

PHYSICAL SYSTEM AND MINING IMPACTS

"The mills originally produced coarse-grained jig tailings." This is half-true. The jigs produced a coarse-grained fraction, and a slime fraction. The stamp mills that were used to crush the ore were like huge hammer-and-anvil devices. This produced a wide range of particle sizes, from microscopic dust to fragments up to an inch or so across. These particles were mixed with water and "jigged" to gravitationally separate the dense ore minerals from the less-dense gangue and rock-forming minerals. Since settling velocity decreases with decreasing density and grain size, very fine-grained particles did not settle in the jigs, and remained suspended in the slimes. The jig mills had an outlet pipe for slimes and a separate outlet pipe for coarse-grained tailings. The slime tailings generally were discarded directly into the creek, and were washed away quickly. The coarse tailings also were discarded into the creek, but they tended to accumulate, especially during periods of low-flow. Therefore, accumulations of coarse jig tailings are more common than accumulations of slimes, which nevertheless are major components of tailings-contaminated sediments of the jig era.

Response Text

Text modified to include reference to fine-grained jig tailings.

Coeur d' Alene Basin - Remedial Investigation
Draft
Comments by Commenter
Art Bookstrom

Comment No.	Version	Subsection / Add'l Ref	Doc ID
	* No Watershed *		

7-Summary

2286 Draft | 4.1 | **1713**

Comment Text

GEOLOGY/GEOCHEMISTRY

"The rock in which the mineralization occurs. . ." Mineralization is a process, not a thing. It would be better to say something like "The rock in which the veins occur. . ."

"The mineralization also tends to parallel the South Fork. . ." It would be better to say something like "Many of the veins strike at low angles to the trend of the South Fork valley."

"The presence of primary metal carbonate and primary metal sulfides in the formations were identified as two of the primary mechanisms that directly affect water chemistry and control the migration of metals." Use of the word "primary" is problematic here. In one case primary may mean "early" (before secondary), and in the other it probably means "most important."

Are metal carbonate minerals primary in the sense that they formed along with the host rocks, or with the veins? What carbonate minerals are you talking about? Metal-carbonate minerals, such as lead carbonate (cerrussite), are secondary weathering products of "primary" vein galena. Or do you mean iron-, magnesium-, manganese-, calcium carbonates, which are present as rock-forming minerals, as vein minerals, and as alteration products, which can be considered as primary, secondary, or tertiary in terms of either paragenesis or importance.

Carbonate and metallic sulfide minerals are present in the veins and locally in their host rocks, especially near the veins. Iron-, magnesium-, manganese-, and (or) calcium-bearing carbonate minerals are primary gangue minerals in veins of the CdA district. Carbonate minerals also are present in altered host rocks around most veins. Ferroan dolomite is more widely distributed in carbonate-bearing strata of the Wallace Formation.

Iron-, lead-, zinc-, copper-, and silver-bearing sufide and sulfide-arsenide-antimonide minerals also are common in veins, and locally are disseminated in altered host rocks around the veins. Pyrite (iron sulfide) is more widely distributed as a minor constituent of argillitic rocks of the Prichard Formation

Response Text

Text modified for clarification and to incorporate the suggestions in the comment.

2287 Draft | 4.2 | **1714**

Comment Text

ORE DEPOSITS

This description is almost the same as that in section 3.2.6.3, and it has the same problems. I don't want to repeat my comments. Maybe you could rewrite it and divide it between the two sections, or rewrite it, leave it where it is, and refer back to it here.

Response Text

The text has been modified to match changes made to section 3.2.6.3 in Part 1.

2288 Draft | 5.3.6 | **1715**

Comment Text

SUMARY OF FINDINGS

Dissolved Versus Total Concentration: You should explain, either here in the text, or in a footnote to table 5.3.6-1, how you calculated this percentage. Is it ((total minus dissolved)/total))*100?

Response Text

Text modified to state that these results were calculated using the MIT diffuse-layer model. The model is described in Part 1, Section 5.4.1.5.

Coeur d' Alene Basin - Remedial Investigation
Draft
Comments by Commenter
Board of Commissioners

Comment No.	Version	Subsection / Add'l Ref	Doc ID

*** No Watershed ***

0-Comment Pertaining to Entire Document

1959	Draft	General	131

Comment Text

We are writing to express some of our thoughts on the Draft Remedial Investigation for the Coeur d'Alene Basin. We expect that the conclusions of this document will be the foundation for your proposed remedies in the resulting Record of Decision. The scientific validity of your conclusions needs to be certain. It does not appear to us that the Draft RI creates this certainty.

Data is referenced from various sources with various protocols, gaps, and inconsistencies. There are an alarming number of references to estimates, assumptions, conceptualizations, expectations, projections, probabilities, and the use of modeling, which suggests an alarming amount of guessing in the process. How do these guesses compound the risk of error when they are combined in calculations and models? We are concerned that the volume of data within the report will mask the need for certainty in the data and certainty in the conclusions.

We want to insure that the conclusions reflect scientific truths and not exaggerations. We do not interpret the RI to document an imminent threat to human health or to the environment. We do not interpret the RI to reflect a medical emergency related to contamination from heavy metals anywhere within the Coeur d'Alene Basin.

The validity of the scientific conclusions is paramount to the future health and the future lifestyles of all who live in Shoshone County and the Coeur d'Alene Basin. We ask that you guarantee the scientific validity of the data and the calculations in the RI report. Please provide for a thorough peer review of all data and procedures by disinterested scientists who are skeptics and are outside of the influence of the agencies who participated in the RI process.

Response Text

EPA affirms its understanding that the objective of the RI/FS process is not the unattainable goal of removing all uncertainty, but rather to support an informed risk management decision. EPA believes that the more than 10,000 samples collected to support the RI/FS, combined with more than 7,000 samples collected independently by IDEQ, USGS, the mining companies, and EPA under other regulatory programs (e.g., NPDES), provide a solid basis to support informed risk management decisions for the Coeur d'Alene basin mining contamination.

Coeur d' Alene Basin - Remedial Investigation
Draft
Comments by Commenter
Brian G. Hansen

Comment No.	Version	Subsection / Add'l Ref	Doc ID

Beaver Creek

2-CSM Unit 1, Upper Watersheds

1939 Draft — Section 1.1 — **1038**

Comment Text — p. 1-1

Section 1.1, p. 1-1, final paragraph. The Draft RI states that "active mining is occurring in the watershed at the Carlisle mine and mill site." This is not true.

Response Text

Text modified to remove this sentence. The Carlisle (Ray-Jefferson) mine and mill were shut down in the late 1950's. Small-scale, independent prospecting is happening in this watershed.

1940 Draft — Section 2.1.6 — **1039**

Comment Text — page 2-4

Section 2.1.6, page 2-4, second full paragraph. The statement is made that "the ore processing history of the Beaver Creek mines is also unclear"(emphasis added). It is important to clarify that only ore mining and beneficiation occurred in the Beaver Creek watershed. "Processing" is a technical and regulatory term exclusive to specific activities that would occur at either the Bunker Hill smelter or zinc plant operations. Therefore, the use of the term "processing" or "process wastes" should not be used. This error occurs at numerous locations throughout the Draft RI Report. It is important that the report note that smelting (and thus processing) occurred at only one location in the Basin: the Bunker Hill Smelter Complex.

Response Text

The sentence has been modified.

1941 Draft — Section 2.1.6 — **1040**

Comment Text — p. 2-4

Section 2.1.6, p. 2-4, third full paragraph. The statement is made that "tailings production for the watershed has been estimated at nearly 2 million tons ." This statement may lead some readers to the conclusion that this mass of tailings was discharged to streams. No mention is made of the Carlisle tailings pond. The RI should note that, of the 2 million tons of tailings, a significant volume is isolated in a tailings impoundment.

Response Text

The sentence has been modified for clarity.

1942 Draft — Section 2.2.2 — **1041**

Comment Text — pp. 2-6 and 2-7

Section 2.2.2, pp. 2-6 and 2-7. A comparison of the aquifers of Beaver Creek with Smelterville Flats and Canyon/Ninemile Creeks is made without the requisite technical studies allegedly because "it is reasonable to expect" and "is probably comparable." As noted in the Companies general comments (see Section 2.4 of these comments), such broad generalizations are speculative and may grossly mischaracterize hydrogeologic conditions in the Beaver Creek drainage. This, in turn, would not support meaningful evaluation of any groundwater mitigation measures.

Response Text

Due to the large geographic area of the basin, it was not practical to collect data to fully characterize each source area or watershed. Further site-specific studies will need to be conducted to support design for areas identified for cleanup. Smelterville flats aquifer parameters were selected as a first approximation of aquifer conditions in Beaver Creek because of similar hydraulic conditions (e.g., lower energy system than in Canyon Creek).

1943 Draft — Section 3.0 — **1042**

Comment Text — p. 3-1

Section 3.0, p. 3-1, last paragraph. The statement is made concerning "logging and drill exploration roads" as potential sedimentation sources. The Companies are not aware of any "drill exploration" occurring in this area for decades. All such historic drill roads are either overgrown or used for other purposes. The RI should clarify whether or not there is any current exploration drilling. This can be accomplished by reviewing exploration notifications required by the Idaho Department of Lands (IDL). The IDL records would certainly constitute "available information" that the final paragraph on page 3-3 indicates was reviewed.

Response Text

Text has been modified to say other dirt roads instead of drill exploration roads.

1944 Draft — Section 5.3 — **1043**

Comment Text — p. 5-2

Section 5.3, p. 5-2, final paragraph. The statement is made that "based on review of aerial photographs, sediment sources in Beaver Creek are mining wastes, mobilization of channel bed sediment, bank erosion, and rock debris and tailings piles situated adjacent to channels." The Companies note that a very high level of uncertainty results when sediment sources are identified in the office based

Response Text

The report reflects analysis of available sediment data in Beaver Creek. Additional data could be collected to help refine design or remedial actions.

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Beaver Creek

2-CSM Unit 1, Upper Watersheds

on aerial photographs. This section, and many others within the RI Report, requires actual monitoring data of sufficient quality/quantity to identify true sources of sediment and contaminants, rather than relying on office studies and speculation.

1945 Draft — Section 5.4 — **1044**

Comment Text — p. 5-3

Section 5.4, p. 5-3. The Draft RI Report states "the dissolved zinc load was the only parameter to exceed total maximum daily loads (TMDLs) established for the North Fork at Enaville." The only TMDL the Companies are aware of with "established" loads for dissolved zinc is the TMDL approved by EPA in August 2000; this TMDL does not have loads assigned to the North Fork of the Coeur d'Alene River. Please revise the RI accordingly.

Response Text

The "Loading Capacity" was used as found in column 3 of Table 6-9 on page 31 (EPA, August 2000 Final). The referenced table is entitled "Available Loading Capacity for Dissolved Zinc." Station # is NF400.

1946 Draft — Section 5 — **1045**

Comment Text — Table 5-1

Table 5-1. This table lists minimum and maximum concentrations of an entire data set of analysis results for lead, zinc, and cadmium without differentiating between sources. This procedure grossly exaggerates the data by equating relatively low concentration/high flows of a stream with higher concentration/low (even unmeasureable) flows. While the commentary at Section 5.4 admits this bias, an explanation is not provided regarding the obvious and avoidable reason (i.e. explain and separate the sources). The disparity in the data sources is clearly shown in the Draft RI Report in Table 4.2-1. The highest concentrations are found in the "Adits, Seeps and Pond Sampling" but all flows are "<"(less than) values. Indeed, the BV8147 "LK" sample is standing water in a tailings impoundment and is not a load to Beaver Creek at all.

Response Text

Values in tables 5-1 and 5-2 revised to only include samples from location type "RV".

1947 Draft — Sect. 5 — **1046**

Comment Text — Table 5-2

Table 5-2. As discussed in Section 2.4 of these comments, the problems identified in the above comment concerning Table 5-1 result in the erroneous numbers presented in Table 5-2. After wrongly equating the analysis data set, the "Calculated Average Discharge in cfs"(emphasis added) in Table 5-2 of 100 cfs for Beaver Creek flow results in a dissolved zinc loading of 334 pounds/day. In contrast, the analytical facts of the measured data presented in both Table 4.2-1 and the Data Summary Table for BV1 (mouth of Beaver Creek) shows that at a flow of 85.6 cfs, when coupled with the analysis results of 48 ug/l zinc, results in an actual measured load of approximately 22 pounds/day of zinc. Clearly, the Draft RI overestimates (by a factor of 15) zinc loadings in Beaver Creek. This likely is due to the unfamiliarity of the authors with the conditions and features in the Beaver Creek drainage.

Response Text

The USGS collected a sample from BV1 on May 24, 1999. The flow measured on that day was 141 cfs. The dissolved zinc concentration was 59 ug/L, resulting in an instantaneous load of 45 pounds/day. Results for this sample included in Table 4.2-1. Inclusion of this result shows that the average flow for Beaver Creek listed in Table 5-2 of 100 cfs is within the measured range of flow rates.

Canyon Creek

2-CSM Unit 1, Upper Watersheds

1948 Draft — Section 1.0 — **1047**

Comment Text — p. 1-1

Section 1.0, p. 1-1, second paragraph. The draft RI states "…several time-critical removal actions…" have been conducted in the watershed. The RI must clearly indicate which removals were and were not "time-critical" rather than inferring all removal actions were "time-critical". For example, the major removal action in the watershed to date, the Woodland Park area and sites above, were part of a "non-time critical" removal as evidenced by an EPA memo dated 28 July 1995 from Earl Liverman (EPA) to Randall Smith (EPA). Indeed , an engineering evaluation/cost analysis (EE/CA) was prepared for this removal action, as is required of non-time critical removal actions. An EE/CA is not required for time-critical removals.

Response Text

Reference to time critical removals deleted from text in Part 1 and the Canyon Creek report.

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Canyon Creek

2-CSM Unit 1, Upper Watersheds

1949 Draft — Section 1.0 — p. 1-1 — **1048**

Comment Text

Section 1.0, p. 1-1, second paragraph, last sentence. The draft RI states: "recent monitoring by USGS indicates a plume of metals contaminated groundwater down-gradient from this repository (Box 1999)." The Companies' concern with this statement, is discussed above in Section 2.4 of these comments. A brief explanation of the "Box, 1999" conclusions is warranted within the RI. Certain groundwater monitoring wells in the Woodland Park area are screened in residual tailings, a factor that may not have been known by Box. With an estimated 600,000 cubic yards of material removed from the Canyon Creek floodplain over the past few years, it is also possible that the short-term effects of the removals are still operative.

Response Text

In the fall of 1998, EPA attempted to conduct sampling beneath the Star ponds, but access was denied by the Hecla Mining Company due to their concerns about punching through a less permeable layer beneath the ponds. Nevertheless, EPA contractors did collect data in materials at the same depth and along the perimeter of the Star Ponds.

Analysis of soil, sediment, surface water and groundwater data available for the area around the ponds, the SVNRT repository and the impacted floodplain indicate that there is loading occurring in this area. The Barton 2000 study confirmed there is loading in this area. It is acknowledged that not all the loading in this area is coming from the ponds, but it is identified as a contributor of metals to surface water in this area. Text modified as per above.

1950 Draft — Section 2.1.7.5 — p. 2-6 — **1049**

Comment Text

Section 2.1.7 5, p. 2-6, last sentence. The statement is made that "it is probable that tailings ponds were built over the stream channel, in which case subsurface flow through the tailings impoundments is possible." This statement is not supported. It should be noted that stream channel relocation was not required for the construction of any of the six Star tailings impoundments. These types of speculative statements are not typically found in RI reports at other sites and severely decrease the credibility of the Draft RI Report.

Response Text

The sentence has been modified.

1951 Draft — Section 4.1.5.7 — p. 4-9 — **1050**

Comment Text

Section 4.1 5.7, p. 4-9, second bullet. The Draft RI Report characterizes the Star tailings ponds as a "major source area." As discussed in Section 2.3 of these comments, the Draft RI Report offers no source area characterization data whatsoever to substantiate this claim, which is stated repeatedly throughout the report. The report offers no attempt to quantify seepage through the ponds or the leaching potential of the material comprising the ponds. Further, the report only speculates that there are floodplain tailings underlying the ponds (none are present in the adjacent residential area and it is apparent that the railroad embankment protected the footprint area of the ponds from flood events). In general, the lack of source-area characterization in the Draft RI Report provides no basis for prioritizing remedial activities.

Response Text

See response to Comment #1949.

1952 Draft — Section 4 — Figure 4.1-14 — **1051**

Comment Text

Figure 4.1-14 - What is the basis for the "POTENTIAL TAILINGS AND CONCENTRATES PRESENT" label upgradient of the mill location? It is our understanding that the mill discharged tailings directly to the creek and concentrates were loaded at track level adjacent to the stream.

Response Text

Concentrates and tailings may be present at a variety of locations around millsites. The Call-out on Figure 4.1-14 refers to the general millsite and vicinity and is not intended to indicate the specific location of tailings.

1953 Draft — Section 4 — Figure 4.1-17 — **1052**

Comment Text

Figure 4.1-17 - What is the basis for the two labels "TAILINGS POTENTIALLY PRESENT"? As commented above, tailings were discharged directly to the creek. The location of Canyon Creek is drawn incorrectly, as is the No. 3 adit.

Response Text

The No. 3 adit location is marked on the figure as being unverified. This figure is a composite of information from review of aerial photos and the GIS base coverage. It is intended to give general information on source area attributes related to RI sampling

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		Canyon Creek		
2-CSM Unit 1, Upper Watersheds				
				locations. No information was supplied by the commentor on the correct locations of these attributes; therefore, no changes made to this figure.
1954	Draft	Section 4	1053	
Comment Text		Figure 4.1-22		**Response Text**
Figure 4.1-22 - We are not familiar with the location "Star No. 3 adit". Groundwater from numerous areas of the mine workings, including the Star 2000 level and Omaha tunnel, discharge to the #6 pond.				Reference to Source Area BUR128 removed from figure.
1955	Draft	Section 4	1054	
Comment Text		Figure 4.1-26		**Response Text**
Figure 4.1-26 - This is not a "tailings pile", it is the mine waste rock area.				Figure revised.
1956	Draft	Section 4	1055	
Comment Text		Figure 4.1-2		**Response Text**
Figure 4.1-29 - The photograph/negative is reversed. (The proper view is from the backside of the page.)				Figure removed.
1957	Draft	Section 4	1056	
Comment Text		Figures 4.1-33 & 4.1-34		**Response Text**
Figures 4.1-33 & 4 1-34 - These are only views of the Star Ponds. These ponds have no association with the Tiger/Poorman or Hidden Treasure.				Figure titles corrected.

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1902 Draft 101

Comment Text

1. Introducti n

The following comments are submitted on behalf of ASARCO Incorporated, Hecla Mining Company, and Coeur d'Alene Mines Corporation (collectively the "Companies"). These comments identify significant defects and inconsistencies with the National Contingency Plan (NCP) in the Draft Remedial Investigation (RI) Report prepared on behalf of the Environmental Protection Agency (EPA) for the Coeur d'Alene Basin. Section 1 of this document presents the Companies' overarching concerns with the Draft RI Report and the context within which it was prepared. Section 2 identifies major categories of flaws and specific examples and consequences of those flaws in terms of inaccurate site characterization that cannot support informed remedial decisions. Section 3 presents detailed specific comments on the Draft RI Report.

EPA's own guidance states:

"the objective of the RI/FS process is not the unobtainable goal of removing all uncertainty, but rather to support an informed risk management decision regarding which remedy appears to be most appropriate for a given site" (emphasis added). [Footnote: Guidance for Conducting Remedial Investigations/Feasibility Studies Under CERCLA, Interim Final, EPA 1988. EPA/540/G-89-004. October.]

The Draft RI Report does not serve this goal. The RI finds significant problems in all areas of the Basin. These findings, which greatly exaggerate actual impacts, result in an inaccurate characterization of the nature, extent, fate, and transport of contamination in the Basin allegedly resulting from historical mining and milling operations. This distorted characterization of Basin conditions, and the overestimation of the environmental effects of historic mining and milling, provide an unreliable and illogical basis for developing and evaluating remedial alternatives in the Feasibility Study (FS).

The Companies and their experts have prepared and/or reviewed RI reports for many sites around the country. Comparison of other RI reports to the Coeur d'Alene Basin Draft RI Report highlights the latter as a highly biased and thus inaccurate evaluation. The normal process, as outlined in the above-cited RI/FS guidance document, calls for the preparation of the RI as a first step to objectively characterize site conditions. Risk assessments are then prepared based on the findings of the RI, and additional information is collected, as needed, to support the risk assessments. The FS is then prepared, based on the objective findings of the RI and the risk assessments. The purpose of the FS is to formulate reasonable remedial alternatives.

The process being implemented by the U.S. in the Coeur d'Alene Basin RI/FS is contrary to the standard RI/FS process. The initial investigations of the U.S. Government were conducted to support its Natural Resource Damages (NRD) claims and appeared designed to maximize the public's perception of such damages. The U.S. Government then used the NRD data and analysis, and retained many of the individuals responsible for the NRD investigations, to support the Ecological Risk and the Human Health Risk Assessment for the Basin. Objectivity was lost and, not surprisingly, enormous risks to ecological and human receptors were identified in EPA's risk assessments. Finally, the U.S. has prepared the draft RI and FS Reports, again using much of the same data and analysis that supports the NRD documents. In this way, the U.S. has inappropriately interwoven preparation of its NRD and remedial claims, sacrificing the legitimacy, objectivity, and credibility of both.

Response Text

EPA acknowledges the legal positions of the Mining Companies expressed in these comments, as also expressed by these same Companies in litigation against the U.S. EPA disagrees with a number of these positions, but does not believe that comments or response to comments on the draft RI/FS reports are an appropriate forum for supporting respective legal positions.

EPA affirms its understanding, as the Companies point out, that the objective of the RI/FS process is not the unattainable goal of removing all uncertainty, but rather to support an informed risk management decision. EPA believes that the more than 10,000 samples collected to support the RI/FS, combined with more than 7,000 samples collected independently by IDEQ, USGS, the mining companies, and EPA under other regulatory programs (e.g., NPDES), provide a solid basis to support informed risk management decisions for the Coeur d'Alene basin mining contamination.

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The U.S. first chose to address the supposed consequences of mining in the Basin outside the 21-square mile Box by use of its Clean Water Act and NRD authorities -- a so-called multi-media approach. It developed preliminary conceptual restoration alternatives costing billions of dollars. Having now reversed the course and declared NRD subordinate and "residual" to remedy, the U.S. now strives to justify remedial measures likely to be significantly more elaborate and costly than any that would have resulted from a normal, objective RI/FS process.

The RI represents a significant effort in terms of labor and cost, yet only 160 of an estimated 1,080 source areas have been characterized and many of the sub-watersheds within the Basin have not been characterized at all. In addition, the RI relies heavily on data collected in the late 1980s and early 1990s that are now a decade old. Further, surface water samples taken during the RI were often collected downstream of significant floodplain removal efforts (e.g., in Canyon Creek and Ninemile Creek) as those removal efforts were underway. Data from these samples reflect the short-term effects of the removal actions, do not reflect ambient conditions, and contribute to the RI's exaggeration of surface water loadings. Overall, the RI has provided little gain in terms of our understanding of the Coeur d'Alene Basin for what the FS identifies as an enormous and costly cleanup effort.

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1903	Draft		102

Comment Text

2. Maj r Flaws

The following subsections identify five major categories of flaws, inaccuracies, exaggerations, and misleading statements present in the Draft RI Report. Specific examples of these are cited and, where appropriate, their consequences are discussed.

2.1 Failure to Account for Actual Conditions

Like the draft Ecological Risk Assessment that preceded it, the draft RI Report places undue reliance on the litigation-driven Report of Injury Determination (ROID) [Footnote: Stratus, 1999. Report of Injury Assessment: Draft Coeur d'Alene Basin Natural Resource Damage Assessment. Prepared by Stratus Consulting, Inc., Boulder, CO, for U.S. Fish and Wildlife Service, U.S.D.A. Forest Service, and Coeur d'Alene Tribe. Draft. July 19, 1999.] prepared for the trustees as part of their Natural Resource Damage case. The result is an RI Report that fails to account for actual conditions in the Basin in two very important respects. First, the report fails adequately to account for a multitude of non-mining anthropogenic effects on the ecosystems and ecological resources of the Basin. Second, the report fails to recognize that healthy ecological conditions exist in large portions of the Basin, despite the presence of elevated levels of metals in soil, sediment, surface water, and groundwater. These issues were discussed in detail in a series of expert reports provided by the Companies.

This deficiency is most evident in Part I, Section 3.6 (Condition of Ecological Resources) of the Draft RI Report. It purports to summarize the ecological condition of the Basin, but instead consists largely of a summary of the conclusions of the ROID. As such, it does not discuss the thriving populations of fish and waterfowl found especially in the Lower Basin, the presence of thick stands of vegetation, even in areas of mixed tailings and floodplain alluvium, and the considerable natural recovery that is occurring in the Basin.

EPA has recently circulated a draft "Technical Memorandum" on the alleged "secondary effects of mining related hazardous substances" in the Basin – the so-called Technical Memorandum No. 1 ("TM1"). The Companies plan to separately comment on this document.

Response Text

EPA has made reasonable use of a number of existing sources of information, reducing the costs of otherwise duplicate efforts. Data sets relied upon by the RI includes data collected by the EPA, USGS, USFS, IDEQ and the mining companies (MFG).

EPA has also made efforts to recognize and account for non-mining effects on the Coeur d'Alene ecosystem.

EPA believes that the more than 10,000 samples collected to support the RI/FS, combined with more than 7,000 samples collected independently by IDEQ, USGS, the mining companies, and EPA under other regulatory programs (e.g., NPDES), provide a solid basis to support informed risk management decisions for the Coeur d'Alene basin mining contamination.

It is not clear from review of the data if natural recovery is occurring or not. Review of the available surface water data from 1991 through 2000 did not show a decrease in concentration over time. This may be because of the many ongoing sources in the Basin.

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The RI Report can only serve to inform risk management decisions in the Basin if it is substantially revised to account for real-world evidence of the ecological health of much of the Basin and to recognize the pervasive effects of non-mining human activities on habitat in the Basin.

1904 Draft **103**

Comment Text

2.2 Inappr priate Screening Levels

The Draft RI Report provides a discussion of "screening levels" and their derivation (see, for example, Attachment 4 to Part 2, CSM Unit 1, Big Creek Watershed).

That discussion states that:

"The screening levels were used in the RI to help identify source areas and media of concern that would be carried forward in the Feasibility Study. For the evaluation of site soil, sediment, groundwater, and surface water chemical data, the lowest available (emphasis added) risk-based screening level for each media was selected as the screening level. If the lowest risk-based screening level was lower than the available upper background concentration, the upper background concentration was selected as the screening level. Groundwater data are screened against surface water screening levels to evaluate the potential for impacts to surface water from groundwater discharge."

As discussed in the following paragraphs, screening levels established using this methodology are inappropriately low and do not allow for differentiation of areas that truly are in need of remediation from those that are not.

Soil screening levels for antimony, mercury, and silver established in the Draft RI Report are the EPA Region 9 Preliminary Remediation Goals for residential land use. Residential remediation goals are low by definition. In general, residential land use takes into account daily exposure to soil by young children (0 to 6 years of age), who typically are more susceptible than older children and adults to adverse health effects from exposure to metals. Remediation goals for commercial/industrial land use typically are higher than for residential land use, reflecting the decrease in exposure frequency and duration and the low probability that young children would be exposed under a commercial/industrial setting. Finally, remediation goals for recreational land use are higher still because exposure frequency and duration for young children would be even less than under a commercial/industrial land use scenario. The vast majority of the mining and milling related source areas in the Coeur d'Alene Basin are not subject to residential, commercial/industrial, or even recreational land use. Therefore, use of residential Preliminary Remediation Goals as screening levels for these source areas clearly is inappropriate and provides the public with the false impression that these source areas pose unacceptable levels of risk.

As previously described, the Draft RI Report uses surface water screening levels to evaluate groundwater because of "the potential for impacts to surface water from groundwater discharge." This approach is inappropriately conservative because it does not account for the significant and rapid dilution of groundwater that typically occurs when such groundwater discharges to a stream. The surface water screening levels for dissolved metals are based on criteria (e.g , Federal Aquatic Water Quality Criteria, Aquatic Plant Chronic Benchmarks, etc.) that were formulated very conservatively to protect the most sensitive of aquatic species. Such species do not reside in groundwater, which should be evaluated using Drinking Water Standards to the extent groundwater serves

Response Text

Exceedence of screening levels does not by itself indicate any unacceptable risks due to mining contamination. Screening levels simply focus attention on the highest areas of contamination.

EPA has made no final determinations about the need for remedial alternatives to address groundwater in the Basin. Additional groundwater data may be collected to support design if necessary.

Background concentrations have been developed for the Upper Basin, Lower Basin, and the Spokane River Basin. The background concentrations presented in the RI are discussed in detail in a technical memorandum included as Appendix B to the Final Ecological Risk Assessment and has been incorporated into the Administrative Record.

The Draft RI report makes no findings of contaminant loading based on property ownership.

The Draft FS report does not reach the conclusion that all mine workings and waste pose high risks to human health and the environment.

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as a supply for domestic water use. The surface water quality criteria are almost always much lower than Drinking Water Standards, sometimes by an order of magnitude or more. Some examples are presented in the following table:

Metal (Dissolved)	Groundwater Screening Level1 (µg/L)	Drinking Water Standard2 (µg/L)	Factor by Which Drinking Water Standard Exceed Screening Level
Cadmium	0.95		
Copper	1.1	30	1,300
Manganese	2.45	50	2
Mercury	77	2	2
Silver	43	10	230
Zinc	3	5	0	170

1 - From Table 5, Attachment 4 to Part 2, CSM Unit 1, Big Creek Watershed. These are the same as the surface water screening levels.

2 - Federal Primary or Secondary Maximum Contaminant Level, from Table 2, Attachment 4 to Part 2, CSM Unit 1, Big Creek Watershed

Clearly, the use of the conservative surface water screening levels to evaluate groundwater is inappropriate and results in the mischaracterization of groundwater in much of the Coeur d'Alene Basin as impacted and needing to be addressed by remedial alternatives developed during the FS process.

EPA's selection of "background" concentrations for soil and sediment, which are in many cases used as screening levels, is based on a series of biased analyses that skew the "background" concentrations toward lower values. Specific factors that result in this bias are:

1. inclusion of large datasets for unmineralized areas that are not analogous to the Coeur d'Alene River Basin (e.g., soil and sediment data from the St. Joe River Basin);

2. use of a spatial averaging method to develop the data set for statistical analysis;

3. presentation of single values to represent background concentrations, rather than presentation of a range of background concentrations; and

4. focus on average conditions across a very large area that includes the smaller mining-impacted sites and that neglects to consider the range of conditions specifically within mineralized areas of the Coeur d'Alene River Basin.

Factors 1, 2, and 4 are very effective methods for reducing the mean and median values of the baseline data set and narrowing its variability. The net effect of the spatial averaging method is to remove the highest values from the final data used to describe

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baseline (the "pooled reference data"). The justification given for this flawed approach is that the combination of opportunistic sampling methods and inclusion of individual samples that may have been affected by mining activities in the pooled reference data likely result in a high bias to the final data set. The highest metals concentrations from the original datasets (not spatially averaged) are those from soils collected from "mineralized" areas of the basin, and these are the areas of interest for the baseline characterization because they are the areas where metals release to soil and local sediment occurred. The upper end of the data distribution is therefore critical to the description of baseline in source areas and is not adequately considered in the baseline evaluation. Instead, the median concentrations and upper percentiles of spatially averaged data are used.

As previously noted, EPA has established site-specific Preliminary Remediation Goals for the Coeur d'Alene Basin through the risk assessment process. Though the Companies' do not agree with these goals, it is unclear why they were not considered within the RI. Instead, the Draft RI Report develops and presents a series of literature-based screening levels in lieu of the Preliminary Remediation Goals. Thus, the screening levels presented in the Draft RI Report appear to be superfluous.

The above paragraphs highlight the troubling issues associated with the screening levels developed and presented in the Draft RI Report. Overall, the screening levels are inappropriately low. Unfortunately, the report relies on the screening levels to identify areas and environmental media in the Coeur d'Alene Basin that require attention during the FS. Because the screening levels are inappropriately low, the Draft RI Report essentially concludes that every area where metals are present is problematic. The Draft RI Report also concludes that there are widespread and significant environmental problems in the Basin. Application of more appropriately derived screening levels would place site conditions in a responsible perspective for the public, eliminate the "need" to address many areas of the Basin, and allow the FS to focus on and prioritize those areas that truly are in need of mitigation.

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1905	Draft		104

Comment Text

2.3 Inadequate Source Area Characterizati n

The Draft RI Report represents a significant effort in terms of labor and cost, yet very few of the potential source areas (less than 15 percent) have been characterized by sampling. EPA admits that the available data are limited in the following statement (Part 1, Section 4.2.4 2.1, Source Areas, p. 4-33):

"Of approximately 1,080 identified source areas, samples were collected from approximately 160. Less than 5 samples were collected from the majority of these source areas; therefore, data are not available to directly evaluate most of the source areas."

The extremely limited nature of the available source-area data is also noted in the Draft FS Report (Part 3, Ecological Alternatives, Section 1.4.2.5, Current Loadings, p. 1-33):

"With the exception of adits that discharge directly to surface water, available data are generally inadequate to directly estimate current loadings from individual sources in the basin."

The paucity of information to characterize specific sources, and the statistical extrapolation of the limited existing data in an attempt to characterize unsampled sources, eliminates any logical prioritization of source remediation. With this fundamental flaw, the Draft RI Report cannot support the FS in the development and selection of meaningful and cost-effective remedial alternatives.

Response Text

See response to Comments #1904 and 1906.

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The Draft RI Report relied on statistical extrapolation of the limited existing source area data to characterize unsampled source areas (Part 1, Setting and Methodology, Section 4.2.4.2.1, p. 4-34)

"though not all adits [mine tunnel discharges], waste rock piles, and tailings ponds were sampled and analyzed, similar mining-related processes produced these same source types throughout the basin. It is therefore reasonable to assume that if measured adit, waste rock, and tailings metals concentrations exceeded screening levels, then metals concentrations in source areas of these same types (but were not sampled) would also exceed screening levels".

This is a significant leap of faith, given that less than 15 percent of the identified source areas have been sampled. Further, the data from the 160 sampled source areas are biased toward higher concentrations because these source areas required the most urgent investigation and mitigation. As an example, the Draft RI Report compiled chemical data for several source areas, including mine tunnel (adit) drainage (see Part 1, Setting and Methodology, 4.2.4-1). A summary of the RI compilation for adit drainages is as follows:

Metal Screening Level1 (ug/L) N of Measurements Average ug/l
Zinc (dissolved) 30 15 1 690
1 The screening level indicated above is one of several used in the Draft RI Report to identify areas of "elevated" metals concentrations. These levels are in themselves problematic, as discussed further in Section 2.5 of these comments.

Based on this overgeneralized approach, the above data would suggest that, from a Basin-wide perspective, zinc in adit drainage exceeds the screening level and therefore all adit drainages within the Basin are problematic. Actual measurements contradict this finding. A report entitled "Hydrogeologic Analysis and Reclamation Alternatives for the Jack Waite Mine, Shoshone County, Idaho [Footnote: University of Idaho (UID), 1979. Hydrogeologic Analysis and Reclamation Alternatives for the Jack Waite Mine, Shoshone County, Idaho. Completion Report prepared for the U.S.D.A. Forest Service. Prepared by G. Gaillot and D. Ralston, College of Mines and Earth Resources, University of Idaho, Moscow. August 1979.] provides chemical data for several adit drainages in the Eagle Creek drainage, which ultimately enters Prichard Creek and thence the North Fork of the Coeur d'Alene River. These data were not considered in the Draft RI Report. Though the data are over 20 years old, they are expected to adequately characterize the adit drainages because neither mining nor remedial activities have occurred in the Jack Waite Mine area since the data were collected. The data collected by the University of Idaho indicate that several small adits in the vicinity of the Jack Waite Mine drain water with zinc concentrations that are very low. For instance, measurements made on 15 separate days of "Adit F, Portal Above Duthie Townsite in Duthie Creek Drainage" indicated a dissolved zinc concentrations that averaged 18 ug/l, well below the problematic "screening level" of 30 ug/l and nearly two orders of magnitude lower than the statistically established average zinc concentration in adit drainages. These data demonstrate that the statistical generalizations presented in the Draft RI Report can result in overestimation of mining-related impacts to the Basin.

As discussed above, the Draft RI Report provides little information on actual sources of contamination. Instead, the report identifies historic mine workings and wastes as "sources" of loading to streams solely on the basis of source locations relative to the streams and without the site-specific data invariably required by EPA under the NCP to support remedy development. The Draft RI Report manifests this flaw by: (1) presenting estimated metal loadings (in pounds per day) by broad stream reaches where metal loadings increase, and (2) ascribing all of the loading increases in the stream to historic mine sites or waste accumulations adjacent to those reaches, particularly where those sites or waste accumulations are owned by one of the defendants in the ongoing litigation. Proper

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source characterization would require actual data or estimates of water seepage through the mine wastes, metal solubility (leaching potential) in the mine wastes, metal attenuation in the subsurface prior to groundwater discharge to the stream, and groundwater flow direction evaluations, all of which are lacking from the Draft RI Report. Thus, the data and characterizations presented in the Draft RI Report regarding loadings in surface water are of little use with respect to developing and prioritizing remedies for specific source areas.

An example of this source mischaracterization issue is as follows. At numerous locations, the Draft RI Report states:

"It is believed (emphasis added) that groundwater interacts with floodplain tailings deposits under the Hecla-Star tailings ponds, and is augmented by mine drainage water discharged to the ponds"

(this statement is included in Part 1, Setting and Methodology, Section 2.2.3, Canyon Creek. p. 2-7). The Draft RI Report does not support the "belief" that the Star Ponds are a major source of contamination with site-specific lithologic, hydrogeologic, and geochemical evaluations. For example, the RI authors did not evaluate available geotechnical information regarding the ponds' construction. [Footnote: See, for example: Report on Investigation and Design Star Nos. 1 to 5 Tailings Impoundment Extensions, Wallace, Idaho for Hecla Mining Company: Dames and Moore, March 19, 1980; and Report on Investigation and Design Star No. 6 Tailings Impoundment, Wallace, Idaho for Hecla Mining Company: Dames and Moore, May 29, 1979.] Instead, the RI identifies the Star Ponds as "a major source area" (Part 2, Canyon Creek Watershed, Section 4.1.5.7) simply because the ponds exist within the Canyon Creek valley. Without supporting information to determine if the Star Ponds are truly a significant source, and the actual mechanisms by which metals may be dispersed from the ponds, there is no basis to prioritize them as a "major" source area. Overall, the Draft RI Report's pervasive characterization of historic mining and milling sites as "sources" based only on proximity to streams will result in an FS report that can reach only one conclusion: all historic mine workings and wastes pose high risks to human health and the environment and therefore must be addressed. While clearly supportive of the U.S. Government's NRD claims and an EPA claim designed to capture the Trustees' agenda should the NRD claims fail, an FS Report that reaches this conclusion is meaningless to development of reasonable and cost-effective source control and related remedial alternatives.

The Draft RI Report provides very little discussion of metals sources that are not related to historic mining and milling. The report should emphasize that the South Fork Coeur d'Alene River (and, to a lesser degree, the North Fork of the Coeur d'Alene River) drains one of the most richly mineralized areas in the world and that the water quality and sediment effects of historic mining and milling activities are superimposed on the natural water quality and sediment effects of the erosion of this important ore body, particularly at a local level in the upstream areas. The Draft RI Report makes little mention of this important relationship and does not quantify the effects due to mining relative to the effects of natural mineralization and development patterns. The Draft RI Report also does not acknowledge the input of metals to surface water from urban runoff (e.g. from Spokane), a phenomenon that is well-documented by the USGS. [Footnote: See, for example, "U.S. Geological Survey Urban Stormwater Data Base of Constituent Storm Loads; Characteristics of Rainfall, Runoff, and Antecedent Conditions; and Basin Characteristics." U.S. Geological Survey Water Resources Investigations Report 87-4036 by M.H. Mustard, N. E. Driver, J.Chyr, and B.G. Hansen, 1987.] Metal contributions in runoff particularly from the Spokane metropolitan area (and possibly that of the Coeur d'Alene area) should be quantified and discussed. As previously discussed, the Draft RI Report also makes comparisons to the St. Joe and St. Regis rivers as "reference areas", but does not acknowledge the lack of natural mineralization (or urban development patterns) in these "reference areas" relative to the rich mineralization (and locally intense urban development) of the Coeur d'Alene Basin

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Comment Text

2.4 Use of Non-Representative Data and or Lack f Data f r Many Areas, Resulting in Err neous Conclusi ns

Many of the watersheds of the Coeur d'Alene Basin were not specifically studied in connection with the Basin RI/FS. Nevertheless, the Draft RI Report attempts to characterize the unstudied watersheds based by unsupported analogy to areas where limited data are available. In other instances, the Draft RI Report draws incorrect conclusions based on inappropriate use of the available data. Examples are cited in the following paragraphs.

Very few groundwater data were collected in the Beaver Creek and Big Creek drainages, and these data do not include aquifer characteristics. Nevertheless, the RI "assumes" that hydrogeologic conditions in those drainages are similar to those of Canyon Creek and the South Fork Coeur d'Alene River valley aquifer system within the Bunker Hill Superfund Site, which were studied. The hydraulic conductivity of the Beaver Creek alluvium is "assumed" to be similar to that of these studied aquifers. Given that hydraulic conductivity can vary over 14 orders of magnitude [Footnote: Freeze, R A. and J A. Cherry, 1979. Groundwater. Prentice Hall, Englewood Cliffs, NJ.], it is possible that groundwater flow conditions in the Beaver Creek alluvium are grossly mischaracterized in the Draft RI Report. The Draft RI Report also states that there are "probably" localized areas of stream gain and loss in Beaver Creek, again without supporting data. In the face of these uncertainties, it is unclear how the FS can meaningfully evaluate possible groundwater alternatives in this area.

The Draft RI Report relies on overgeneralization of the limited available data to arrive at unrealistically high estimates of metal loading potentially emanating from the specific watersheds. Using Beaver Creek as an example (Part 2, CSM Unit 1, Beaver Creek Watershed), the RI provides a range of measured metal concentrations from all waters measured in the drainage (including ponded water on top of flotation tailings impoundments). The RI then takes the average of all of these metal loadings and couples the averages with an assumed average stream discharge in an attempt to predict metal loadings (in pounds per day) in Beaver Creek. The resulting estimated zinc loading is 334 lb/day at the mouth of Beaver Creek (see Part 2, Beaver Creek Watershed, Table 5-2), as opposed to a maximum measured zinc loading of 24 lb/day (see Part 2, Beaver Creek Watershed, Table 4.2-1). The "estimate" provided in the Draft RI Report is 14 times the highest measured loading. The overestimate of metal loading is linked to the erroneous inclusion of tailings pond water in the derivation of average metal concentrations for the stream and an obvious bias for high loading estimates. The tailings pond water is perched on top of the low permeability tailings and is hydrologically isolated from Beaver Creek. Based on this mischaracterization, remedial measures could ultimately be called for in the Beaver Creek drainage that are far more costly and intensive than is truly necessary.

The Draft RI Report provides erroneous and biased conclusions regarding water quality trends with time. For example, the Draft RI Report incorrectly asserts that

"based on increased loads in the lower portion of Canyon Creek, there is no compelling evidence that remediation efforts to date have had a positive impact on stream conditions" (Part 2, Canyon Creek Watershed, Sections 5.5.2 5, 5.5.3.5, and 5.5.4.5).

The Draft RI Report relies on plots of zinc, lead, and cadmium loadings over time to support this assertion. Review of these plots reveals "shotgun" patterns showing little correlation between the measured loadings and time (see Part 2, Canyon Creek Watershed, Figures 5.5-8, 5 5-12, and 5.5-17). The RI does not provide any indication of the "goodness of fit" of its straight lines through these

Response Text

Due to the large geographic area of the basin, it was not practical to collect data to fully characterize each source area or watershed. Further site-specific studies will need to be conducted to support design for areas identified for cleanup.

EPA believes that the more than 10,000 samples collected to support the RI/FS, combined with more than 7,000 samples collected independently by IDEQ, USGS, the mining companies, and EPA under other regulatory programs (e.g., NPDES), provide a solid basis to support informed risk management decisions for the Coeur d'Alene basin mining contamination.

The Draft RI/FS reports presently do not call for costly and intensive remedial measures for the Beaver Creek watershed. If any such measures are considered in the future, additional site-specific data may be collected.

The Canyon Creek report section has been revised to remove the reference to unpublished data from S. Box 1999. This referred to a series of figures prepared by S. Box of the USGS and presented at a public meeting. The figures were contour maps of zinc data collected from monitoring wells and compiled by MFG in the 1997 Woodland Park Groundwater Report. The contours clearly show a zone of increased zinc concentrations in the area near the SVNRT repository, Star ponds, and the floodplain sediments.

In the fall of 1998, EPA attempted to conduct sampling beneath the Star ponds, but access was denied by the Hecla Mining Company due to their concerns about punching through a less permeable layer beneath the ponds. Nevertheless, EPA contractors did collect data in materials at the same depth and along the perimeter of the Star Ponds. Sampling of groundwater, surface water, and sediments was conducted in this area for the Basin RI/FS by the USGS and EPA in 1998 and 1999. These additional data were reviewed and confirmed the original draft analysis presented by S. Box. Though the relative contributions from these three sources (SVNRT repository, Star ponds, and the floodplain sediments) cannot be determined from the available data, it is clear from the RI/FS data and the historical data compiled by MFG that there are significant contributions of metals to the Creek from this reach.

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data. These straight lines provide the basis for the RI's assessment of increasing or decreasing trends. Further, the data depicted in these figures span the time period from the early 1990s through the late 1990s, during which significant removal activities were implemented in lower Canyon Creek. Such activities likely resulted in a short-term increase in some metal loads. Therefore, evaluation of these data to identify temporal concentration trends likely will lead to erroneous conclusions.

Further, a more thorough evaluation of loadings from the Canyon Creek drainage would have included and integrated groundwater quality data, given the U.S. Government's focus on the importance of gaining and losing stream reaches in Canyon Creek. Such data are presented in MFG 1999 [Footnote: MFG, 1999. 1998 Annual Water-Quality Data Report, Woodland Park, prepared for the SVNRT, February 1998.] and 2000 [Footnote: MFG, 2000. 1999 Annual Water-Quality Data Report, Woodland Park, prepared for the SVNRT, January 2000.] and indicate that groundwater metals concentrations in lower Canyon Creek generally follow decreasing trends, particularly when compared on a seasonal basis. These trends have become more evident over the past 2 to 3 years due to the completion of removal activities in the Canyon Creek flood plain near Woodland Park. Thirteen of the 16 wells monitored in Canyon Creek from 1995 to 2000 indicate measurable decreases in zinc concentrations. The only wells with increases in zinc concentrations (wells CM-3 and CM-5) are known to be completed (screened) in residual tailings that were left during the removal actions to preserve the wells, though this is not acknowledged in the Draft RI Report. The Draft RI Report's incomplete characterization of the Canyon Creek area, and its unwarranted dismissal of the Canyon Creek removal actions, could result in an FS that ignores the significance of these measures in addressing the presence of tailings in flood plain areas.

Another example of an erroneous conclusion, based on limited data, is as follows. At numerous locations in the Draft RI Report (e.g., Part1, Setting and Methodology, Section 1.2.3.4, Canyon Creek), the mine waste repository constructed by the Silver Valley Natural Resource Trustees (SVNRT) in the Woodland Park area of the Canyon Creek drainage is identified as the source of a "groundwater contaminant plume." The only reference for this statement is "Box, 1999", which is listed as unpublished data collected by the USGS. These data are neither provided nor discussed in the RI. Further, and as mentioned above, the Companies are again aware that two wells (CM-3 and CM-5) located downgradient of the repository are completed (screened) in residual tailings that were left during removal actions to preserve the wells. Clearly, if data from these wells were used to characterize possible effects of the repository, an erroneous conclusion could be reached. Without accurate supporting information, there will be no basis in the FS for addressing the unsubstantiated "plume."

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Comment Text

2.5 Over-Reliance on Statistical Data Evaluations

The Draft RI Report does not provide adequate or clear information to meaningfully evaluate EPA's probabilistic approach. This approach is initially used to develop "estimated", "expected" and/or "average" values of discharge, metals concentrations and metal loads in surface water, and subsequently as a basis for characterizing the nature and extent of contamination in the watershed. Although conceptual discussions of the probabilistic approach are presented in the Draft RI Report, a detailed description of the probabilistic approach is deferred to a forthcoming technical memorandum. Since the memorandum is not yet available, it is not possible to fully understand the probabilistic approach and thus meaningfully comment on the use of this approach as an appropriate method to correctly represent the existing data, characterize the site, and objectively evaluate the reduction in metals loading to surface water and groundwater (and thus, the related risk reduction) that may be achieved by the remedial alternatives considered in the FS. However, given the limited amount of information and limited data relevant to source characterization provided, it would seem that the adequacy of the model to reflect existing data is questionable.

Response Text

A detailed discussion of the probabilistic approach has been presented in a technical memorandum submitted to the Administrative Record.

The comment incorrectly states that "estimated values for discharge, concentrations of metals, and surface water loads — are based on data from another station, CC287, and are incorrectly identified as being associated with station CC288 —-." Data from stations CC287 and CC288 were deliberately combined to represent discharge at the mouth of Canyon Creek as data at CC288 were biased high because samples were more often taken during high flow events.

Probabilistic modeling results presented in text, tables, and figures in the RI have been reviewed and revised for consistency with data contained in Appendix C and clearly

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Major flaws and concerns regarding the probabilistic approach described in the Draft RI Report include: (1) pervasive errors, inconsistencies and discrepancies in data presented in the text tables and figures relative to the information presented in the appendices; (2) an unclear and incomplete discussion of the methodology and application of the probabilistic model; and (3) questionable adequacy of the model to accurately reflect site data and conditions. The discussion of Canyon Creek (Part 2, Canyon Creek Watershed, Section 5.5), which relies on the probabilistic approach, is used in the following paragraphs to illustrate these flaws and concerns.

A meaningful evaluation of the probabilistic model is complicated by pervasive errors, inconsistencies and discrepancies between model-derived parameter values that are presented in the text, tables, figures and appendices, and by numerous inconsistencies in the data sets used as model input. For example, estimated values for discharge, concentrations of metals, and metal loads in surface water (in pounds per day) are presented and discussed for station CC288, which is a stream monitoring location at the mouth of Canyon Creek, just above its confluence with the South Fork Coeur d'Alene River. Data from this monitoring station would logically be used, in part, to characterize the surface water loading from the entire Canyon Creek watershed, and to compare the relative significance of contamination from this watershed with other watersheds comprising CSM Unit 1. However, estimated values for discharge, concentrations of metals, and surface water loads reported in Section 5 for station CC288 are actually based on data from another station, CC287, and are incorrectly identified as being associated with station CC288 throughout the text and in Figures 5.5-2, 5 5-4 through 5.5-17, Table 5.5-1, and possibly other tables and figures. Notwithstanding the misidentification of the station, the estimated values are not always consistently presented in the text, tables and figures, and furthermore, do not necessarily match the estimated values presented for either station CC287 or CC288 in Appendix C (where the model input data and statistical calculations are presented).

Inconsistencies in the data sets used as model input are also numerous. For example, at station CC287, a total of 75 discharge measurements, based on data obtained from October 1991 to March 1999, were used to develop the estimated loading values for all of the contaminants of concern that were evaluated using the probabilistic model. In contrast, 92 discharge measurements, based on a longer period of record from October 1991 through August 1999, were used to develop the estimated loading value for total cadmium. It is not explained, nor is it clear from the information provided in the Draft RI Report, why a larger data set was used, or what effect this may have on the model fit, model representativeness, or comparability with other model output values for discharge, concentration and loading.

As a result of these defects, it is difficult if not impossible for the reader to follow the discussions regarding model development and application, to recreate and confirm analyses, or to adequately assess and develop confidence in the interpretations and conclusions presented in the RI based on the probabilistic approach. The unreliability of the probabilistic approach in terms of characterizing existing conditions casts considerable doubt on the use of the probabilistic approach to estimate the future effects of remediation, as will be discussed in the Companies' forthcoming comments on the Draft FS Report.

The lack of clarity and completeness about the methodology and application of the probabilistic approach makes it impossible to fully understand the model and its use. However, given the limited amount of information provided, it would seem that the adequacy of the model to reflect existing data is questionable, and in some cases clearly misrepresents and overstates the actual conditions. For example, the probabilistic approach is used to develop estimated values of discharge, metals concentrations and metal loads in surface water for the various stations in Canyon Creek. Based on data for station CC287, model-derived estimated

labeled to show where results for CC287/288 were combined.

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values of discharge, dissolved zinc concentration, and dissolved zinc mass loading are 53.4 cubic feet per second (cfs), 2,996.4 ug/L, and 556.01 pounds per day (lbs/day), respectively (as indicated in Figures 5.5-2, 5 5-4, and 5.5-5). However, specific details regarding how these values are derived based on the probabilistic analyses are not presented.

Furthermore, no explanation is provided regarding why the "estimated" values based on the probabilistic model differ, sometimes substantially, from the average values that are calculated on the basis of the actual data, or what effect any such differences may have on the characterizations and interpretations presented in the Draft RI Report. For example, based on Canyon Creek data provided in Appendix C for both model-derived estimated values and average values derived from the actual data, the probabilistic model appears to: (1) underestimate the load for several contaminants of concern such as total zinc and total lead (approximately 30 and 55 percent, respectively) at the uppermost watershed monitoring station, CC2, and thus misrepresents the true magnitude of "background" water quality and incorrectly attributes more loading to waste rock and other sources in the downstream segments of the watershed; and (2) overestimates the average load for some contaminants of concern such as dissolved zinc (approximately 12 percent), dissolved cadmium (approximately 12 percent), and dissolved lead (approximately 20 percent) at the mouth of the watershed where station CC288 is located. Though these differences are not large, they illustrate how the Draft RI Report misrepresents the surface water load associated with the watershed and incorrectly attributes more loading to mining-related sources within the watershed than the actual data indicate. As has previously been discussed, overestimation of stream loadings due to the effects of upstream removal actions, assignment of such loadings to mining-related features in the absence of any supporting data, and characterization of loadings at specific stream stations rather than at specific source areas, will not support the development of effective remedial alternatives during the FS process.

The questionable adequacy of the probabilistic approach to accurately describe the existing data can also be seen in the poor fit of straight (regression) lines to the data (despite favorable "goodness of fit" statistics [e.g., r2 values]) in many of the figures used to illustrate application of the probabilistic approach. Numerous statisticians such as Helsel and Hirsch (1992) [Footnote: Helsel, D.R. and R.M. Hirsch. 1992. Statistical Methods in Water Resources, Studies in Environmental Sciences 49. U.S. Geological Survey, Water Resource Division, Reston, Virginia. Elsevier.] caution that decisions about model adequacy cannot, and should not, be based on "goodness of fit" statistics alone, and recommend visual inspection to identify characteristic patterns that indicate a bad model fit. Such characteristics include strong curvature of the data relative to the model regression line and/or outlier influence on the slope of the regression line. These characteristic patterns, which are evident in numerous figures presented in Section 5.5 of the RI (see Figures 5.5-10 and 5.5-14, for example), suggest that the model is highly inadequate and that some other transformation of the data set may be more appropriate, or that a more robust statistical procedure that accounts for outliers should be utilized to model the data. Additionally, even when curvature and outlier influence do not appear to be present, visual inspection also indicates that the model does not adequately describe the existing data especially for total metals concentrations, and conditions where flows, concentrations and/or loads are small.

Furthermore, the inadequacy of the probabilistic model to accurately reflect existing data is illustrated in Section 5.5 of the RI based on information from a station that has a large amount of data (i e , 75 to 92 measurements for station CC287) and thus, where model accuracy would be expected to be highest. As discussed above, the model fit is often poor, even when a station having a large set of data is used to demonstrate model application. But more importantly, the RI does not discuss and/or illustrate the suitability of the model for stations having limited data such as CC288 (18 measurements), where model accuracy would be expected to be lower. Consequently, the adequacy of the model to locations having little data is unclear and undemonstrated.

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In some cases, the authors' reliance on the statistical evaluation of data, rather than on the actual data, results in mischaracterization of site conditions. An example of this occurs in the characterization of the Lower Coeur d'Alene River. Part 7, Summary, Section 5.3.3 of the Draft RI Report, contains the following sentence:

"With few exceptions, estimated dissolved zinc (and cadmium) concentrations generally increase in the downstream direction in the... Lower Coeur d'Alene River."

Again using estimated data, Part 7, Summary, Section 5.3.5 states:

"The increased loads between Cataldo and Harrison are due to increased concentrations, as the estimated discharge remains relatively constant."

Reliance on the statistically derived loading and flow estimates have caused the RI authors to lose track of the measured concentrations, which show decreasing dissolved cadmium and dissolved zinc concentrations with distance downstream on the Coeur d'Alene River. Station LC50 is located near Cataldo and station LC60 is located downstream, near Harrison. The following table summarizes averages of measured concentrations for dissolved cadmium and dissolved zinc at these stations derived from actual data presented in Attachment 2, Data Summary Tables, of Part 3, CSM Unit 2, Main Stem Coeur D'Alene River Watershed (station LC50) and from Attachment 2, Data Summary Tables, Part 4, CSM Unit 4, Lower Coeur d'Alene River and Floodplains (station LC60).

Metal LC50
(upstream station) LC6
(downstream station)
Diss. Cadmium 2 2 ug 1 1.9 ug/l
Diss. Zinc 363 ug 1 344 ug 1

Comparison of the averages for both metals show decreases in the downstream direction from LC50 to LC60, contrary to the statements in Part 7. The same trend is shown when statistically derived concentrations are compared. A more detailed review of the Draft RI Report will likely reveal other such basic errors that result from over-reliance on statistical evaluations with little attention to real data. This, in turn, results an RI Report of questionable credibility.

2368 Draft **221**

Comment Text

EPA distributed the Draft Remedial Investigation (RI) Report for the Coeur d'Alene Basin on October 31, 2000. ASARCO Incorporated (Asarco), along with other Mining Companies, provided comments on the draft RI Report on March 12, 2001. EPA provided brief responses to those comments on July 20, 2001 and asked that commentors provide any further substantive ("fatal flaw") comments to EPA. This document comprises Asarco's "fatal flaw" comments on the draft RI Report.

Overall, the level of effort put forth by EPA to respond to the Mining Companies' comments is disappointing. Asarco expended significant effort to review and understand the draft RI Report and to generate reasoned and well-intentioned comments. Asarco's comments were designed to improve the RI to the point where it could potentially provide a characterization that will allow the logical selection and prioritization of remedial activities within the Coeur d'Alene Basin. Unfortunately, EPA has chosen to ignore

Response Text

EPA will prepare a compilation of all comments received on the draft RI Report, and its responses to those comments, and provide this compilation as an appendix to the final RI Report. The compilation will also be made available through the Administrative Record file for the Coeur d'Alene Basin RI/FS.

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the majority of Asarco's constructive input based on the lack of logic and rationale in EPA's comment responses.
Review of EPA's responses is hindered by the fact that EPA has provided neither a compilation of all comments received on the draft RI Report nor its responses to those comments. Instead, individual commentors have received responses to their specific comments. Without seeing all of the comments on the draft RI Report, and how EPA is responding to those comments, it is difficult to assess what changes EPA is contemplating for the RI Report. This, in turn, hampers Asarco's efforts to prepare its "fatal flaw" analysis.
Overall, EPA's inability to provide meaningful responses to Asarco's comments on the draft RI Report, and its reluctance to share all comments and responses with all commentors, provides only an illusion that the public participation process has been served. Asarco asserts that the public participation process will not have been served with respect to the draft RI Report until EPA: (1) provides logical and thoughtful responses to the comments it received and (2) shares all of the comments and responses with the public. As an initial step toward legitimizing the public review process, Asarco suggests that EPA compile all comments received on the draft RI Report, and its responses to those comments, and provide the compilation to all interested parties.

2369 Draft **222**

Comment Text

Fatal Flaw No 1 – EPA Has Inappropriately Commingled the RI/FS and Natural Resource Damage (NRD) Processes

This issue was strongly pointed out in the Mining Companies' March 12, 2001 comments. However, in its responses to those comments, EPA

"...acknowledges the legal positions of the Mining Companies expressed in these comments, as also expressed by these same Companies in litigation against the U.S. EPA disagrees with a number of these positions, but does not believe that comments or response to comments on the draft RI/FS reports are an appropriate forum for supporting respective legal positions."

Asarco disagrees that this is purely a legal interpretation and asserts that comments on the RI Report are an appropriate forum for discussion of this issue. It is a technical issue because reliance on data collected for the purposes of the Natural Resource Damage Assessment (NRDA), which by definition is designed to maximize perceived impacts, cannot result in a true assessment of Site conditions. The RI/FS process, if implemented according to EPA's own guidance, is intended to objectively evaluate conditions at a given site and to result in remedial alternatives that address sources of environmental contamination in a logical, prioritized, and cost-effective manner. Asarco maintains that EPA, by initiating the NRDA process before the RI/FS process and commingling the environmental data and technical personnel between these two processes, has eliminated the objectivity of the RI/FS process.

Response Text

EPA is aware of no definition that the NRDA is "designed to maximize perceived impacts." Environmental data collected through the NRDA process have been validated and are available for multiple purposes, including the RI/FS. EPA's consideration of the data relevant to the RI/FS helps avoid duplication of efforts and therefore helps control government expense. Failure to consider these data would also conflict with the commentor's suggestion that more data, not less, should be evaluated in the RI/FS.

2370 Draft **223**

Comment Text

Fatal Flaw No. 2 – Failure to Account for Actual Conditions

The Mining Companies' previously submitted comments pointed out that the draft RI Report: (1) fails to adequately account for a multitude of non-mining anthropogenic effects on the ecosystems and ecological resources of the Basin and (2) fails to recognize that healthy ecological conditions exist in large portions of the Basin, despite the presence of elevated levels of metals in soil, sediment, surface water, and groundwater. In response, EPA offered the following language that, for the most part, is not relevant to the comment:

Response Text

1. EPA recognizes that there are healthy ecological conditions in portions of the basin, and accordingly, EPA is not identifying remedial alternatives for the entire basin.

2. The NCP does not require evaluation of impacts from non-hazardous substances (non-mining-related), however, EPA recognizes the non-mining impacts in the Coeur d'Alene Basin. Non-mining related impacts include timber harvest, forest fires, roads, channelization of rivers, and residential/urban development. Attachment A to Appendix K of the Coeur d'Alene Ecological Risk Assessment identifies the non-

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"EPA has made reasonable use of a number of existing sources of information, reducing the costs of otherwise duplicative efforts. Data sets relied upon by the RI includes data collected by the EPA, USGS, USFS, IDEQ, and the mining companies (MFG).

EPA has also made efforts to recognize and account for non-mining effects on the Coeur d'Alene ecosystem.

It is not clear from review of the data if natural recovery is occurring or not. Review of the available surface water data from 1991 through 2000 did not show a decrease in concentration over time. This may be because of the many ongoing sources in the Basin."

The first paragraph of this response pertains to the very limited data that EPA used to characterize contaminant sources within the Coeur d'Alene Basin and is the subject of Asarco's Fatal Flaw Comment No. 4, below. Since EPA provides no information on how it has ".. made efforts to recognize and account for non-mining effects..." and how the draft RI Report will be so modified, Asarco must assume that EPA has continued to ignore, undervalue, and dismiss the evidence of significant non-mining effects on the hydrology, chemistry, and biology of the Basin.

Asarco notes that a primary reason why data from the 1991 to 2000 time frame may not show improvements in water quality is that many significant response actions were underway at that time. Those response actions, which entailed excavation and transport of mine wastes from flood plain areas resulted in short-term releases of metals to the Basin waters that temporarily masked the effects of natural recovery.

Asarco maintains that actual ecological conditions are inadequately characterized in the RI Report, which can only serve to inform risk management decisions in the Basin if it is substantially revised to account for real-world evidence of the ecological health of much of the Basin and to recognize the pervasive effects of non-mining human activities on habitat in the Basin.

Response Text

mining related impacts.

3. The commenter has not provided additional information supporting the statement that natural recovery is occurring.

4. EPA recognizes that there are some areas within the Basin that are not impacted by the mine waste and are ecologically healthy. As noted above, EPA also recognizes that there are non-mining related impacts in portions of the Coeur d'Alene Basin. These situations will certainly factor into risk management decisions regarding cleanup. EPA does not contemplate remedial actions in areas that are unimpacted by the mining wastes.

2371 Draft **224**

Comment Text

Fatal Flaw No. 3 – Screening Levels (Including Background Levels) are Inappropriately Low

The draft RI Report states:

"The screening levels were used in the RI to help identify source areas and media of concern that would be carried forward in the Feasibility Study."

The Mining Companies' previously submitted comments noted several significant problems associated with EPA's selection and use of screening (and background levels) for the Coeur d'Alene Basin. In summary, those problems are:

? use of residential soil screening levels for some metals, when the majority of impacted areas in the Basin are not subject to even recreational use;

? use of much more stringent surface water screening levels to evaluate groundwater, when aquatic biota do not reside in groundwater;

? use of skewed analyses to establish "background" soil concentrations, which are used as screening levels if the lowest risk-based screening level was lower than the background level.

Response Text

The methodology used to select screening levels is accepted practice as a first cut evaluation of available data. Because many of the screening levels are based on background concentrations, the RI focussing the analysis on media with concentrations greater than 10 times and 100 times these screening levels. Even using this less conservative method, many areas with concentrations greater than 10 to 100 times the screening levels were identified, confirming that excessive contamination is pervasive throughout the basin downstream of mining activities.

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The net effect of these problems is that the screening levels are inappropriately low. In response to these comments, EPA states: "Exceedance of screening levels does not by itself indicate any unacceptable risks due to mining contamination. Screening levels simply focus attention on the highest areas of contamination (emphasis added)."

Asarco notes that the soil screening levels established by EPA lie within the range of naturally occurring soil metals concentrations in the Basin, as established by Gott & Cathrall (Geochemical Exploration Studies in the Coeur d'Alene District, Idaho and Montana. U.S.G.S. Professional Paper 1116. 1980). Thus, use of the screening levels to identify areas and media to be carried forward into the FS has only one inevitable outcome: any areas/media with "impacts," whether due to natural mineralization and irregardless of whether such "impact" poses an actual risk to human and environmental receptors, will be evaluated with respect to remedial alternatives. This is contradictory to EPA's response that the screening levels ".. simply focus attention on the highest areas of contamination." Asarco again asserts that the screening levels set forth and used in the RI comprise a fatal flaw because they eliminate any logical prioritization of the remediation effort.

2372 Draft **225**

Comment Text

Fatal Flaw No. 4 – Inadequate Source Area Characterization and Use of Non-Representative Data and/or Lack of Data for Many Areas, Resulting in Erroneous Conclusions.

The Mining Companies' previously submitted comments note the extremely limited data set that EPA used to evaluate source areas within the Coeur d'Alene Basin. In summary, 1,080 source areas have been identified in the Basin, but only 160 (less than 15 percent) of these have been sampled, and fewer than five samples have been collected from the majority of the sampled sources. EPA's own statements in the RI, as quoted in the Mining Companies' earlier comments, confirm that:

"...available data are generally inadequate to directly estimate current loadings from individual sources in the Basin."

In an attempt to address this fatal flaw, EPA: (1) assumes that the relatively few source areas that have been sampled are representative of all identified sources and uses statistical extrapolation from the small subset of sampled sources to characterize the much greater number of unsampled sources, and (2) uses measurement of metals concentrations from streams in the general vicinity of the unsampled sources to infer potential source-area effects on water quality. Asarco reiterates its previous comments on this approach, as summarized below:

? data from the 160 sampled source areas are biased toward higher concentrations because these source areas required the most urgent investigation and mitigation; and
? measurement of metals concentrations in streams reveals the net effects of all potential metal sources, both anthropogenic and natural, between sampling stations.

In response to the previously submitted comment, EPA states:

"Due to the large geographic area of the basin, it was not practical to collect data to fully characterize each source area or watershed. Further site-specific studies will need to be conducted to support design for areas identified for cleanup. EPA believes that the more than 10,000 samples collected to support the RI/FS, combined with 7,000 samples collected independently by IDEQ, USGS, the mining companies, and EPA under other regulatory programs (e.g., NPDES), provide a solid

Response Text

Areas without specific data have not been identified for further action.

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basis to support informed risk management decisions for the Coeur d'Alene Basin mining contamination."

The significant majority of the data EPA cites were collected for the purpose of the NRDA. As previously stated, these data were designed to maximize the perception of harm to the Basin and, importantly, do not characterize contaminant source areas. Such data are critical to an efficient and successful RI/FS. By its own admission, EPA has no site-specific information whatsoever to accurately characterize metals loading, if any, originating from 920 (over 85 percent) of their identified source areas within the Coeur d'Alene Basin. EPA's application of the RI/FS process to an area as large as the Coeur d'Alene Basin does not excuse EPA from implementing a proper characterization of the site sources, as EPA would require of any private party under the same circumstances. Additionally, Asarco strongly disagrees that the available data "provide a solid basis to support informed risk management decisions." EPA's screening-level approach, as described in the previous comment, in conjunction with the critical lack of information on most of the identified source areas, eliminates any possibility of informed risk-management decisions. On the basis of the flawed source characterization presented in the RI, it is unclear how can EPA justify the very high costs of the remedial alternatives set forth in the draft FS Report.

2373 Draft 226

Comment Text

Fatal Flaw No. 5 – Over-Reliance on Statistical Evaluations

The Mining Companies' previously submitted comments noted the lack of clarity and detail with respect to EPA's presentation of its "probabilistic approach" and the pervasive errors associated with the presentation of estimated concentrations and flow rates generated by that approach. EPA's response to these comments indicate that a technical memorandum has been included in the Administrative Record to clarify the probabilistic approach. Asarco had requested a copy of this report when initially reviewing the draft RI and FS documents and had been told it was not available for release. Asarco was not informed that this document is now available for review and therefore cannot comment as to its adequacy. Nevertheless, Asarco's review of the draft RI Report indicates that actual measurements of concentrations and flow rate are typically discarded in favor of statistically generated "expected estimated values." At a minimum, the RI Report should compare and contrast actual measured data with the "expected estimated values" to be sure that these values are reasonable.

In addition, the RI Report must be thoroughly reviewed for instances where use of "estimated expected values" contradicts actual measured values. The example of the Lower Coeur d'Alene River is again noted. The Mining Companies' previous comments quoted the draft RI Report as follows:

"The increased loads between Cataldo and Harrison are due to increased concentrations, as the estimated discharge remains relatively constant (emphasis added)."

However, actual chemical data presented in the draft RI Report, and cited in the Mining Companies previous comments, indicate that dissolved zinc in the Lower Coeur d'Alene River decreases from Cataldo to Harrison. The above sentence, and other inaccuracies that stem from an over-reliance on the probabilistic approach, should be corrected in the revised RI Report.

Response Text

The probabilistic analysis is based on measured data. These measured data are clearly listed for each sampling location modeled in Appendix C and are clearly shown on all the charts showing modeling results.

The text in the RI concerning the concentration increase between Cataldo and Harrison has been corrected to accurately reflect the observed measured data and the modeling results.

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1908 Draft — Glossary of Terms — 107

Comment Text

Several of the definitions provided in the Glossary of Terms appear to have been developed by the RI authors without regard for: (1) strict regulatory definitions, where available, or (2) dictionary definitions. Examples are as follows:

"Agricultural" is defined as "...providing wildlife habitat." This is inconsistent with the dictionary definition.

Conspicuous by its absence is the regulatory definition of "remedial investigation (RI)" found at 40 CFR §300.5. This definition should be included verbatim.

Response Text

Glossary revised to include terms used in the RI.

1909 Draft — Section 1.2.2 — p. 1-6 — 108

Comment Text

Section 1.2 2, p. 1-6, second paragraph. The Draft RI Report describes re-milling of deposited tailings in the 1940s. Such re-milling also occurred also occurred in the 1950's and 1960's. Further, the draft RI discusses the re-milling of tailings already deposited into the stream and states "this effort resulted in the production of additional flotation tailings…" What is not mentioned is that the re-milling also resulted in the reduction of jig tailings volume and the removal of metals (contaminants) from the Basin. The Draft RI Report should be reworded to note that re-milling is beneficial to the environment and is consistent with EPA's mandate for treatment and reduction of contaminant toxicity, mobility, or volume. Further, it should be noted that re-milling resulted in the removal of fine-grained soil from the alluvial deposits underlying the re-milled tailings. The remaining coarse deposits, though of low metal content, have limited capacity to support vegetation. Thus, this limitation is due to physical rather than chemical influences.

Response Text

Remilling of tailings both removed and dispersed metals in the basin; the paragraph has been modified to reflect both.

1910 Draft — Section 1.2.4.3 — Page 1-7 — 109

Comment Text

Section 1.2.4.3: Page 1-7, third paragraph. The RI states here, and in several other locations, that "recent monitoring by the USGS indicates a plume of metals contaminated groundwater" downgradient from the mine waste repository constructed in the Canyon Creek drainage by the SVNRT. The Companies believe this statement to be in error, as discussed in Section 2.3 of these comments. Wells located in the Woodland Park reach flood plain of Canyon Creek were completed in both tailings and underlying alluvium. Lead concentrations in these two material types averaged 47,750 mg/kg and 4,661 mg/kg, respectfully; and zinc concentrations averaged 7,784 mg/kg and 2,404 mg/kg, respectfully (MFG, 1995) . During SVNRT removal activities, tailings and alluvium were removed from most areas contained in the flood plain. Tailings and alluvium in the immediate area around individual wells typically were not removed for those wells that were left undisturbed. In other cases, the excavation machinery inadvertently destroyed certain wells, and the tailings/alluvium in the vicinity of the well were subsequently removed. Wells immediately downgradient of the repository (e.g , CM-3, -4, and -5) were left undisturbed and thus are screened in residual tailings and alluvium that were left in order to preserve the wells. Furthermore, the ground surface around CM-4 and -5 has been flooded for the past 2 or 3 years. Therefore, water quality data collected from these wells may in fact be more reflective of the surrounding unremoved materials rather than the groundwater system as a whole.

Response Text

See response to Comment #1906.

1911 Draft — Section 1.2.4.3 — Page 1-8 — 1010

Comment Text

Section 1.2.4.3: Page 1-8, first incomplete paragraph. The RI Report fails to cite the available detailed information regarding the Gem Portal Pilot Treatment System Project. A report was submitted to EPA on November 8, 1999 that describes the project and

Response Text

The information given in Part 1 is sufficient for the purpose, but more detail can be added to Part 2, CSM 1: Canyon Creek. Text modified to reflect comment.

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presents geotechnical information (test pit logs and the results of grain size analyses, hydrometer tests, Atterberg limits tests, moisture-density tests, compaction tests, consolidation tests, direct shear tests, and triaxial compression tests) for certain areas of the Star Ponds. A subsequent submittal to EPA, provided on April 17, 2000, describes refinements to a portion of the pilot project (i.e , replacement of one of the gravel, subsurface flow wetland cells with a low-permeability, compost-based bioreactor). These items should be referenced and discussed, where appropriate, in the RI Report.

1912 Draft | Section 1.2.4.4 | p. 1-8 | **1011**

Comment Text

Section 1.2.4.4, p. 1-8. The Draft RI Report describes removal actions conducted by the USDA Forest Service at the Charles Dickens and Silver Crescent mine and mill sites in the Moon Creek drainage. The discussion notes that wastes from these sites were placed in an unlined repository. The revised RI Report should include groundwater chemistry data from upgradient and downgradient of this repository to characterize its effectiveness.

Response Text

Data currently not available, therefore this discussion cannot be included.

1913 Draft | Section 1.2.4.8 | p. 1-11 | **1012**

Comment Text

Section 1.2.4.8, p. 1-11, final paragraph. The Draft RI Report describes a treatment system at the Morning Mine. The Morning No. 6 adit system was in use by 1987 (not 1989) and is a wetland treatment system built on top of the "waste rock dump." Water infiltrating through the waste rock is collected and discharged to the South Fork under a NPDES permit. The RI Report should be revised to note that this is a permitted discharge and to describe the relationship between permitted discharges and "releases" within the CERCLA context.

Response Text

Text modified to state this water is discharged to the South Fork. It is irrelevant in identifying sources to the River whether a discharge is permitted or not.

Though there may be a permitted discharge from a point source, discharge from this point source does not account for metals moving in groundwater beneath the waste rock dump and potentially discharging to the stream.

1914 Draft | Section 2.2 | Page 2-4 | **1013**

Comment Text

Section 2.2, Page 2-4, first paragraph. The draft RI states "Canyon and Ninemile Creeks also have the highest concentrations of metals among the larger tributaries (with the possible exception of the creek within the Bunker Hill Superfund Site)." Is this unnamed creek Government Gulch Creek? Even with the limited monitoring data readily available to us we see that as late as the year 2000 surface water in Government Gulch Creek contained cadmium as high as 240 ug/l and zinc as high as 8,980 ug/l. The Companies note that these significantly elevated concentrations are present in spite of the U.S. Government's considerable cleanup efforts in Government Gulch.

Response Text

Text revised to indicate that Canyon and Ninemile Creeks have the highest concentrations in areas covered by this RI.

1915 Draft | Section 2.2 | Page 2-4 | **1014**

Comment Text

Section 2.2: Page 2-4, last paragraph and bullets. This section includes a bulleted list of metal "source types" that fails to acknowledge the presence of naturally mineralized areas in the Coeur d'Alene Basin. This deficiency should be corrected by adding the following items to this bulleted list, and to other such lists where they appear in the RI:

naturally mineralized bedrock present on hillsides and beneath alluvial fill in the valley bottoms;

metal-enriched alluvium that was derived from the erosion of mineralized source areas; and

natural seeps and springs that emanate from mineralized faults and joints.

Response Text

The CSM presents mining-related sources of metals. The non-mining related sources of metals listed in the comment contribute to the background concentrations of metals observed in soil, sediment, and surface water. By using the background concentrations in conjunction with risk-based screening levels, locations with background concentrations of metals or less are screened out from further evaluation in the RI/FS process.

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1916 Draft — Section 2.2.2 — Page 2-6 — **1015**

Comment Text

Section 2.2 2: Page 2-6, fourth paragraph. This section notes that "concentrations of metals (in Big Creek) were low and did not indicate any harm to aquatic life." Significant mining and milling activities have occurred in the Big Creek drainage and mill tailings impoundments (and other mine wastes) are present. As discussed in earlier general and specific comments, the Draft RI Report identifies the Star Ponds as "a significant source" because an increase in metal loading is observed in Canyon Creek in the vicinity of the ponds. The settings of the tailings impoundments in Big Creek and the Star Ponds in Canyon Creek are analogous. To the extent possible, in light of the complete lack of source characterization data, the RI Report should address this difference and identify the reasons why the mechanisms that cause the RI authors to "believe" that the Star Ponds are a significant source to Canyon Creek are not operative in the Big Creek drainage.

Response Text

Dissolved zinc results for BC260 (located at the mouth of Big Creek just downgradient form the Sunshine Tailings piles) do not exceed AWQC; therefore, the piles were not identified as a major source. Dissolved zinc concentrations at CC284 (just upgradient of the Hecla-Star tailings ponds), CC285 (adjacent to the ponds), and CC357 (just downgradient from the ponds), show a steady increase in estimated expected concentrations (1,368, to 1,463, to 3,102 ug/L) moving past the ponds which are the largest source area in this immediate area.

1917 Draft — Section 2.2.3 — Page 2-7 — **1016**

Comment Text

Section 2.2 3: Page 2-7, second complete paragraph. This section states "it is believed that groundwater interacts with floodplain tailings deposits under the Hecla-Star tailings ponds and is augmented by mine drainage water discharged to the ponds." The Companies find this statement, which is made at many locations throughout the RI Report, to be groundless. Please see the rationale presented in Section 2.3 of these comments. The RI Report should either support the statement with site-specific data (e.g., boring logs demonstrating the existence of floodplain tailings beneath the piles, estimates of seepage through the piles supported by measured data, batch adsorption test results to measure the extent to which the piles may serve as a source, etc.) or remove the statement from the RI.

Response Text

See response to Comment #1906.

1918 Draft — Section 2.2.3 — Page 2-7 — **1017**

Comment Text

Section 2.2 3: Page 2-7, third complete paragraph. This paragraph states "monitoring of groundwater in the floodplain suggests that a plume of metal has formed in association with the new (SVNRT) tailings repository." As stated in the general comments above, the data upon which this statement is made are neither provided nor discussed in the Draft RI Report. Further, the Companies note that two wells located downgradient of the repository are screened in residual tailings and thus may present a false picture of groundwater quality in the Woodland Park area. Finally, significant construction has recently occurred in this area that may have resulted in a short-term change in groundwater quality. The RI Report should provide a complete analysis of these issues when characterizing any potential affects that could be attributable to the repository.

Response Text

See response to Comment #1906.

1919 Draft — Section 2.3.3 — Page 2-12 — **1018**

Comment Text

Section 2.3.3: Page 2-12, final paragraph carrying over to page 2-13. The RI Report states that some portions of the North Fork Coeur d'Alene River and its tributaries are suitable reference areas for the South Fork because they have been subjected to similar non-mining related impacts. This is an incorrect comparison. The cited portions of the North Fork and its tributaries are far less mineralized than the South Fork, contain significantly lower population densities and corresponding lower levels of urban development, and do not include the significant transportation corridors (e.g., the interstate highway and railroad) that are present in the South Fork valley. Therefore, use of the North Fork and its tributaries as reference areas is not appropriate. Please revise the RI Report to acknowledge this difference, and recalculate the "background" concentrations such that they are consistent with the presence of an important ore body.

Response Text

The North Fork was used in the Ecological risk assessment (Technical Memorandum 1) as a reference area for evaluating physical impacts (secondary effects) from mining. Uncertainties in using this reference are discussed in the EcoRA. The North Fork was not used as a reference area for any evaluation of chemical impacts from Mining which is the focus of the RI. Additionally, the background concentrations used in the RI as part of the screening level evaluations, have been reviewed and revised to include background ranges more applicable for the upper basin (mineralized area), the lower basin and Spokane river basin (non-mineralized areas). Results are presented in the Final Background Technical Memorandum.

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1920 Draft — Section 2.5 — **1019**

Comment Text — Page 2-17

Section 2.5: Page 2-17, first incomplete paragraph. The RI notes that ambient water quality criteria are exceeded in Coeur d'Alene Lake and then states that "the lake supports populations of aquatic life including several valued species of fish that provide recreational fishing...". These statements may appear contradictory to the general public and therefore require further explanation. The RI Report should describe how the ambient water quality criteria were formulated and comment on the conservative nature of those criteria. In addition, the RI should describe the robust condition of the fishery in Coeur d'Alene Lake.

Response Text

Fish species observed in the Lake are metal tolerant. The AWQC are set at concentrations protective of sensitive fish species.

1921 Draft — Section 3.2.6 — **1020**

Comment Text — Page 3-14

Section 3.2.6: Page 3-14. The RI Report should provide an additional section that describes the effects of erosion on the ore bodies in the Coeur d'Alene Mining District. This section should note that major vein structures trend across many currently incised drainages (e.g., Canyon Creek and Ninemile Creek), discuss the likely fate of the rich ore material that was removed from those drainages during the incision of the drainages, and delineate the effects of this material, and the vein structures that were subsequently exposed at the surface, on groundwater, surface water, and sediment quality in the Basin. This issue is addressed in Section 2 2 of these comments. Inclusion of this discussion will provide a more balanced representation to the general public of the sources of metals in the Basin.

Response Text

The non-mining related sources of metals listed in the comment contribute to the background concentrations of metals observed in soil, sediment, and surface water. By using the background concentrations in conjunction with risk-based screening levels, locations with background concentrations of metals or less are screened out from further evaluation in the RI/FS process.

The background concentrations used in the RI have been revised to include soil and sediment background concentrations for the Upper CDR basin, the Lower CDR basin, and the Spokane River basin. Calculation methods and data are included in a Technical Memorandum included as Appendix B to the EcoRA and in the Administrative Record. The relative impacts of surficial expression of ore veins are discussed in this Technical Memorandum.

1922 Draft — Section 3.3 — **1021**

Comment Text — Page 3-17

Section 3.3: Page 3-17, first paragraph of the section. The Draft RI Report states that "Mining activity in the basin has exacerbated the natural weathering of various metal-bearing minerals by exposing them to additional water and oxygen thereby resulting in additional (emphasis added) releases of metals to surface water and groundwater." The use of the term "additional" in this sentence implies the authors' concurrence with the Companies that releases of metals from non-mining-related sources have occurred, and continue to occur, within the Coeur d'Alene Basin. As discussed in Section 2.2 of these comments, a significant flaw of the Draft RI Report is that it does not even attempt to quantify these natural releases relative to those associated with historic mining and milling. Instead, the Draft RI Report ascribes the presence of all metals in the Basin to historic mining and milling activities. A revised RI Report that fully acknowledges the natural releases and quantifies them will set the stage for a much more reasonable and effective remedy in the FS, particularly for source-area tributaries.

Response Text

The non-mining related sources of metals listed in the comment contribute to the background concentrations of metals observed in soil, sediment, and surface water. By using the background concentrations in conjunction with risk-based screening levels, locations with background concentrations of metals or less are screened out from further evaluation in the RI/FS process.

1923 Draft — Section 3.4.1.3 — **1022**

Comment Text — Page 3-24

Section 3.4.1.3, Page 3-24, first paragraph. The Draft RI Report identifies "perched zones in saturated mine tailings within above-grade impoundments" as groundwater. The use of the term "groundwater" in the same context as groundwater within natural alluvial sediments is misleading. The tailings present in above-grade impoundments in the Coeur d'Alene Basin are modern flotation tailings that, for the most part, are extremely fine-grained and thus of very low hydraulic conductivity. Water present within these tailings primarily comprises water that was used to slurry the tailings to the impoundment. It is pore water that is

Response Text

The inclusion of perched zones in saturated mine tailings is defined correctly and clearly in this section. These are not the only unnatural groundwater systems. The water in the mixed tailings and alluvium is considered groundwater and is by definition not natural.

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essentially trapped. In fact, removal of pore water from fine-grained flotation tailings is a difficult endeavor using even the most aggressive geotechnical methods (e.g , installation of wick drains and loading with fill to load and consolidate the tailings and expel the pore water). Reference to tailings pore water in the same context as natural groundwater will convey an inaccurate picture to the public that the pore water is somehow available to the environment and indicates a lack of hydrogeological understanding and/or experience with modern flotation tailings on the authors' part. Further, this paragraph states that above-grade tailings impoundments "have a significant impact on both local and regional groundwater and surface water quality." As noted in Section 2.3 of these comments, the Draft RI Report provides no information whatsoever, other than general proximity to the stream, to link the impoundments to groundwater and surface water quality issues in the Coeur d'Alene Basin. In order to support this statement, the RI should quantify seepage rates, metal solubility (leaching potential), and subsurface attenuation of metals for these impoundments.

Though permeability in mine tailings within above-grade impoundments may be less than in other "groundwater" systems, if they are saturated, they will eventually discharge water and associated metals to either more permeable groundwater systems or adjacent surface water.

Permission to drill in the tailings ponds to collect site-specific data was requested by EPA but was not granted by the mining companies.

1924 Draft | Section 3.4.1.4 | **1023**

Comment Text | Page 3-32

Section 3.4 1.4: Page 3-32, first complete paragraph. The Draft RI Report provides a quotation from Stratus, 1999. That quotation references The Revised Final Hydrogeologic Assessment Report for the Bunker Hill Superfund Site, prepared by Dames and Moore in 1991, with regard to stream gain and loss in Woodland Park and Osburn Flats area. The Final Hydrogeologic Assessment report did not address these areas as they are outside of the Bunker Hill Superfund Site. The Draft RI Report (and perhaps the 1999 Stratus report) are erroneous in this regard.

Response Text

Text changed to reflect Stratus 2000 and the studies of Canyon Creek by Houk and Mink 1994, Box et al 1997, and Paulson and Girard 1996: "Dissolved metals are leached into the underlying floodplain aquifer by percolating rainfall and snowmelt or rising groundwater. The permeable floodplain aquifer rapidly routes water from losing stream reaches (where the valley floor widens) to gaining stream reaches (where the valley narrows), efficiently transferring dissolved metals from floodplain soils to the stream."

1925 Draft | Section 3.6 | **1024**

Comment Text | Page 3-47

Section 3.6: Page 3-47, final paragraph, carrying over to page 3-48. The Draft RI Report states that the assessment of current ecological conditions is "largely from the studies associated with the NRDA injury assessment report." As discussed in Section 2.1 of these comments, this imparts a fundamental bias to the assessment. The NRDA injury assessment report was prepared to maximize the public's perception of mining-related harm to the Coeur d'Alene Basin. The RI authors' unconditional acceptance and reliance on the information in the NRDA injury report results in the same bias in the Draft RI Report. As has previously been stated, the biased RI cannot support the development of rational and cost-effective remedial alternatives. Many of the Companies' comments on the Ecological Risk Assessment pertain to this entire section of the Draft RI Report.

Response Text

In preparing the Draft RI, EPA independently reviewed numerous sources of relevent information. Data sets used in the RI are summarized in Part 1 Section 4. Additional technical information is cited in the reports. See also response to Comment #1903.

1926 Draft | Section 4.2.2 | **1025**

Comment Text | Page 4-9

Section 4 2.2: Page 4-9, first incomplete paragraph. The Draft RI Report states "because reported metals concentrations were deemed to be much greater than applicable risk-based screening levels or available background concentrations, data generated using judgmental sampling designs were deemed to be of a level of quality sufficient to meet data quality objectives and confirm historical results." This statement is problematic from two perspectives. First, as discussed in Section 2 2 of these comments, the screening levels and background levels were inappropriately selected and are biased low. This bias, in turn supports the authors' use of judgmentally collected (i e , biased) data. More reasonable and defensible (and thus higher) screening and background levels would cast doubt upon the judgmentally collected samples. Second, the samples were "judgmentally" collected to support the U.S. Government's NRD case. Thus, it is highly unlikely that the samples were collected with any degree of objectivity. The result of these problems is a significant exaggeration of mining-related impacts in the Coeur d'Alene Basin.

Response Text

"Judgmental sampling designs" reflect EPA's efforts to focus its sampling activities on areas reasonably anticipated to be impacted by mining contamination. This approach conserved resources that could otherwise have been consumed by studying areas where no mining impacts were anticipated or observed.

The background concentrations used in the RI have been revised to include soil and sediment background concentrations for the Upper CDR basin, the Lower CDR basin, and the Spokane River basin. Calculation methods and data are included in a Technical Memorandum included as Appendix B to the EcoRA and in the Administrative Record.

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				EPA has made reasonable use of a number of existing sources of information, reducing the costs of otherwise duplicate efforts. Data sets relied upon by the RI includes data collected by the EPA, USGS, USFS, IDEQ and the mining companies (MFG). Data sets used in the RI are summarized in Part 1 Section 4. Additional technical information is cited in the reports.
1927	Draft	Section 4.2.4.2.1	1026	
Comment Text		page 4-33		**Response Text**
Section 4.2.4.2.1, page 4-33, third full paragraph: The RI notes: "of approximately 1,080 identified source areas, samples were collected from approximately 160. Less than 5 samples were collected from the majority of these source areas; therefore, data are not available to directly evaluate most of the source areas." As noted in the Companies' general comments (see Section 2.3, above), the severe lack of data to characterize specific source areas eliminates the possibility of the RI achieving one of its most fundamental goals: providing a sound basis to prioritize source area remediation.				See response to Comment #1902.
1928	Draft	Section 4.2.4.2.1	1027	
Comment Text		p. 4-34		**Response Text**
Section 4.2.4.2.1, p. 4-34, second paragraph. This paragraph states: "though not all adits, waste rock piles, and tailings ponds were sampled and analyzed, similar mining-related processes produced these same source types throughout the basin. It is therefore reasonable to assume that if measured adit, waste rock, and tailings metals concentrations exceeded screening levels, then metals concentrations in source areas of these same types (but were not sampled) would also exceed screening levels." As noted in the Companies' general comments (see Section 2.3, above), given the severe lack of source area data (less than 15 percent of the source areas were sampled), and the fact that the data that do exist characterize the more significant source areas in the Basin, this approach likely results in overestimation concentrations in unsampled areas.				See response to Comment #1902.
1929	Draft	Section 5.1	1028	
Comment Text		p. 5-2		**Response Text**
Section 5.1, p. 5-2, first paragraph. The RI states: "For the evaluation of site soil, sediment, groundwater, and surface water chemical data, the lowest available (emphasis added) risk-based screening level for each media was selected as the screening level. If the lowest risk-based screening level was lower than the available upper background concentration, the upper background concentration was selected as the screening level. Groundwater data are screened against surface water screening levels to evaluate the potential for impacts to surface water from groundwater discharge." As discussed in the Companies' general comments (see Section 2.2, above), this approach results in inappropriately low screening levels that compromise the RI's ability to support informed source-area remediation decisions.				See response to Comment #1904.
1930	Draft	Section 5.2	1029	
Comment Text		p. 5-3		**Response Text**
Section 5.2, p. 5-3: Section 2.2 of these comments describe the Companies' concerns with the "background" concentrations derived in the Draft RI Report and cites reasons why these "background" concentrations are inappropriate. In summary, these reasons are: (1) inclusion of large datasets for unmineralized areas that are not analogous to the Coeur d'Alene River Basin (e.g , soil and sediment data from the St. Joe River Basin); (2) use of a spatial averaging method that ignores the highest naturally occurring concentrations to develop the data set for statistical analysis; and (3) focus on average conditions across a very large area that includes the smaller mining-impacted sites and that neglects to consider the range of conditions specifically within mineralized				The background concentrations used for screening purposes in the RI have been updated to include background ranges for the upper basin, lower basin, and the Spokane River basin to better reflect differences between mineralized and non-mineralized areas. See the Final Background Technical Memorandum (Eco RA Appendix B) for calculation methods and data sets used.

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areas of the Coeur d'Alene River Basin.

Soil background concentrations for the upper basin were generated from data collected by Gott and Cathrall (1980). A very small fraction sampling points within this data set were collected from the St. Joe River watershed.

1931 Draft — Section 5.2.1 — p. 5-5 — **1030**

Comment Text

Section 5.2.1, p. 5-5, third complete paragraph: Regarding "background" soil and sediment concentrations, the Draft RI states: " For screening purposes, we selected background concentrations from the likely distribution. Evidence that the values selected are representative of at least highly mineralized portions (emphasis added) of the basin is available from data collected for this RI and for the Bunker Hill RI." The Draft RI Report offers no readily discernible "evidence" that the selected background concentrations are representative of highly mineralized areas. If the RI authors believe this to be true, this point requires considerable expansion.

Response Text

See response to Comment #1930.

1932 Draft — Section 5.2.1 — p. 5-6 — **1031**

Comment Text

Section 5.2 1, p. 5-6, last incomplete paragraph: Regarding metal concentrations in soil in the Woodland Park area, the Draft RI states: "...one would expect the lower (left) side of the plot to represent the mixture of alluvium derived from mineralized and non-mineralized areas (natural background) (emphasis added), and the distinct population toward the right of the plot to represent mining wastes or mixtures of mining wastes and natural alluvium." The emphasized portion of this statement indicates the RI authors' concurrence that metals are naturally present in alluvium due to the erosion and transport of material from mineralized areas. However, the Draft RI does not evaluate this background effect on the quality of groundwater or surface water. Instead, the Draft RI Report attempts to ascribe the presence of metals in Basin waters to the presence of mine waste, resulting in a biased characterization.

Response Text

See response to Comment #1930. The non-mining related sources of metals listed in the comment contribute to the background concentrations of metals observed in soil, sediment, and surface water. By using the background concentrations in conjunction with risk-based screening levels, locations with background concentrations of metals or less are screened out from further evaluation in the RI/FS process.

1933 Draft — Section 5.2.1 — pp. 5-8 and 5-9 — **1032**

Comment Text

Section 5.2 1, pp. 5-8 and 5-9: The Draft RI Report suggests that some metals present in soil and alluvium may be attributable to "exposure to contaminated groundwater." It is noteworthy that the Draft RI Report provides no assessment of "background" groundwater quality (Section 5.2.2, p. 5-10 states: "the limited information on groundwater that is available for the basin does not allow a general estimate of background"). The report text states that the presence of metals in groundwater is due to contact with mining wastes. As discussed in the Companies' previous comment, the RI authors concur that alluvium derived from mineralized source rock is present in the Basin. Further, the RI authors have not considered interactions between bedrock and alluvial groundwater systems. Where the bedrock is mineralized, groundwater that is naturally enriched in metals likely enters the alluvium. Both the presence of mineralized alluvium, and discharges from mineralized bedrock groundwater systems, will result in elevated "background" concentrations of metals in groundwater. Therefore, a component of the "contaminated" groundwater cited in the Draft RI Report clearly is naturally occurring. Again, a quantitative distinction between such naturally occurring concentrations, and those associated with mine wastes, is not presented in the RI. This distinction is necessary to place the effects of past mining and milling practices into the proper perspective.

Response Text

The non-mining related sources of metals listed in the comment contribute to the background concentrations of metals observed in soil, sediment, and surface water. By using the background concentrations in conjunction with risk-based screening levels, locations with background concentrations of metals or less are screened out from further evaluation in the RI/FS process.

1934 Draft — Section 5.4.2.2 — p. 5-3 — **1033**

Comment Text

Section 5.4 2.2, p. 5-32. Section 2.5 of these comments provides the Companies' concerns regarding the use of the probabilistic model. In summary, application of the model is poorly explained; "estimated" values derived in the RI using the model cannot be reproduced using this explanation; details of the model application are deferred to a forthcoming technical memorandum,

Response Text

See response to comment # 1905.

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precluding a meaningful review at this time; and significant discrepancies and errors exist between appended data, tabulated data, and data that are presented graphically. Further, the RI authors' reliance on estimates made using the probabilistic approach in some cases results in findings that conflict with trends exhibited by actual measured data.

7-Summary

1935 Draft — General — **1034**

Comment Text

Note: The Companies' general and specific comments regarding the Draft RI Report's failure to account for actual conditions in the Basin, inappropriately low screening levels (including background levels), inadequate source area characterization, use of non-representative data or lack of data for source areas, and the probabilistic model pertain to Part 7 and are not reiterated. Measures taken to address the Companies' comments in these regards should be applied to Part 7, as appropriate. Additional specific comments are as follows.

Response Text

See response to Comments #1902 to #1906.

1936 Draft — Section 4.4 — p. 4-5 — **1035**

Comment Text

Section 4.4, p. 4-5, final paragraph. The Draft RI Report states "Fracture flow in bedrock contributes some recharge to the overlying unconfined groundwater system. However, the contribution of metal contamination from bedrock fractures or faults is expected to be localized to the intersection with mine workings." The Companies agree with the first sentence of this statement, but note that the second statement is completely without basis. Numerous bedrock structures, including mineralized faults, fault splays, and joints, subcrop beneath the alluvium within the Basin (particularly in the upper part of the watershed). While many of these structures have been mined, others have not. Through this unsupported statement, the RI authors have dismissed an important component of background metals concentrations in the Basin's groundwater.

Response Text

The non-mining related sources of metals listed in the comment contribute to the background concentrations of metals observed in soil, sediment, and surface water. By using the background concentrations in conjunction with risk-based screening levels, locations with background concentrations of metals or less are screened out from further evaluation in the RI/FS process.

1937 Draft — Section 5.2.1 — p. 5-5 — **1036**

Comment Text

Section 5.2.1, p. 5-5, third paragraph. The Draft RI Report states that "a trend of increasing concentrations in groundwater is noted in well samples adjacent to and downstream of the Hecla Star Tailings pile and the Silver Valley Natural Resource Trustees repository... as a result of the presence of mining waste." As discussed previously in the Companies' comments, two factors that likely contribute to the RI author's perception are: (1) certain of the wells completed in this area are screened in residual tailings and thus likely provide data that do not accurately characterize groundwater conditions and (2) significant removal actions have occurred in the Woodland Park area and it is possible that the short-term effects of these actions are still present.

Response Text

See response to Comment #1949.

1938 Draft — Section 5.3.3, Section 5.3.5 — p. 5-8, p. 5-9 — **1037**

Comment Text

Section 5.3 3, p. 5-8, first complete paragraph, and Section 5.3.5, p. 5-9, second paragraph. The Draft RI Report states that dissolved zinc concentrations increase in the downstream direction in the Lower Coeur d'Alene River. As discussed in Section 2.5 of these comments, this trend is incorrectly identified, apparently due to an over-reliance on statistically developed estimates rather than straightforward use of actual data.

Response Text

As mentioned previously, the trends in estimated and average dissolved zinc concentrations agree for the Lower Coeur d'Alene River. They both decrease between Cataldo and Rose Lake and increase between Rose Lake and Harrison.

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Canyon Creek

2-CSM Unit 1, Upper Watersheds

2374 Draft — Table 5.7-1 — **231**

Comment Text

This memorandum contains notes on the summary review of URS's draft responses to comments submitted by Ridolfi Engineers Inc. (Ridolfi) on the Draft Coeur d'Alene basin Remedial Investigation (CdA RI). The draft responses were dated July 19, 2001, and supplied in electronic form as "RI_DraftComments_Ridolfi.pdf". As requested by Anne Dailey, the review was limited to looking for substantive issues. While the points raised here may not constitute "fatal flaws," they are valid concerns that have not been addressed or for which the changes proposed to be made in the RI are unclear. Where comments are cited below, we have used the comment number assigned by URS's database system rather than the original comment number assigned by Ridolfi.

1. Ridolfi had raised the issue of discrepancies between the lists of major source areas in Table 5.7-1 of the Canyon Creek section, and Tables 5.4-1 of the upper and lower South Fork, Ninemile Creek, and Pine Creek sections, and the main text of those sections, or the lists prepared for the Feasibility Study (FS). The draft responses from URS state that the tables were deleted and replaced with text narrative describing major source areas to be consistent with the FS. However, we did not have a copy of this narrative or the list of major source areas as it presented in the current version of the FS and so we are unable to determine how it compares to our recommendations.
The comments covered by this are numbered 1422, 1426 to 1441, 1480 to 1482, 1484 to 1495, 1521, 1522, 1525 to 1528, 1531 to 1533, and 1549 to 1559 in URS's list.

Response Text

The major loaders were originally identified in Appendix D of Technical Memorandum 1.

(URSG and CH2M HILL. 2000. Draft Technical Memorandum No. 1: Candidate Alternatives and Typical Conceptual Designs, Coeur d'Alene Basin Feasibility Study. Prepared for U.S. EPA Region 9. February 4, 2000.)

Use of this list in the RI does not preclude the identification of other sources. Further assessment may be conducted in subsequent work and data gathering in the basin.

Lower Coeur d'Alene River

4-CSM Unit 3, Lower Coeur d'Alene River

2375 Draft — **232**

Comment Text

2. In response to comment No. 1583 requesting clarification of which CSM the Harrison delta has been included in, the responder stated that part of the delta is included in segment LCDRSeg06 of CSM 3, and the balance in segment CDALakeSeg02 of CSM 4. The delta is an important location because this is the point of accumulation of a portion of the contaminated sediment coming from the Coeur d'Alene River into the lake. We recommend that the CdAR delta be treated as a discrete entity for remediation purposes.

Response Text

The delta has been identified for remediation purposes. Please refer to the Feasibility Study.

2378 Draft — **235**

Comment Text

5. Comment No. 1594, regarding lateral extent and depth of contaminated sediment in the Lateral Lakes (CSM 3): the comment requested consideration of the sediment mapping effort conducted by the USFWS in support of the NRDA; the RI response indicated that the USFWS data was depth-limited to 15 cm, and that the RI relies solely on the cores obtained from four transects conducted during the FSPA Nos 1 and 2. This approach limits the data set used in the RI and may result in an overestimate of the amount of contaminated sediment in the Lateral Lakes. It may not allow for an accurate determination of the extent of contamination for alternative development in the FS process.

Response Text

Sediment volume estimates are included in the Feasibility Study for better continuity with development and comparison of alternative.

2379 Draft — **236**

Comment Text

6. Comment Nos. 1602 and 1604 regarding the lack of sediment transport analyses for reach between Cataldo to Rose Lake: This was identified as a serious oversight; previous comments have suggested the use of sediment data from Enaville as being representative of the reach. The response to Comment 1602 was "Comment noted, it is unfortunate that sediment transport data are not available." Sediment data is available and was perhaps not used correctly (Rose Lake data from 8 miles downstream was

Response Text

Sediment transport data are not available specifically for this reach. The available Rose Lake data were referenced and appropriately qualified as to their limitations. Additional data may be collected in the future if needed for remedial design.

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Lower Coeur d'Alene River

4-CSM Unit 3, Lower Coeur d'Alene River

initially transposed to this reach). It may be appropriate at this point in the process to simply add a sentence clarifying that additional sediment transport analyses will be performed as a part of remedial design process.

2380 Draft **237**

Comment Text

7. Comment No. 1604 requested a discussion of processes found in the segment of the Lower CdAR from Rose Lake to Cataldo, which we consider to be in CSM 3. The response was "Discussion of Cataldo to Rose Lake is contained in the Main Stem Coeur d'Alene River Watershed report" (which is in Part 3: CSM 2). We feel this is a problem because :
a) We believe this section of the river to be in CSM 3, and that this portion of the river is should be discussed in portion of the FS that discusses CSM 3. We understand the boundary between CSM 2 and CSM 3 to be at the last riffle on the main stem at the point where the old highway bridge crosses the river (as shown in Figure 1.1-1 of Part 4: CSM 3). We believe the discussion in the RI should generally follow the same format, and be supportive of the alternative development in the FS; and
b) The river processes found in the segment from Rose Lake to Cataldo (in an ~8-mile segment that represents a transition zone below the confluence of the North and South Forks) would not be representative of those found in the main stem above it. We also had concerns for the main stem portion of the report regarding the use of the data from the lower portion of the river to represent the upstream segment (Comment No. 1572).

We recommend that the CdAR between Cataldo and Rose Lake be treated as a discrete entity for remediation purposes, and that in light of an apparent data gap concerning sediment transport processes in both the CSM 3 reach (see comment 6 above) from Rose Lake to Cataldo, and the CSM 2 Main Stem of the CDAR above Cataldo, it be clarified that additional sediment transport analyses will be performed as necessary in support of remedial design in these segments.

Response Text

The Rose Lake sediment transport discussion appears in both the Main Stem discussion (CSM Unit 2) and the Lower Coeur d'Alene River discussion (CSM Unit 3) because sediment transport information specific to the Main Stem is not available.

Also see response to Comment #2379.

2381 Draft **238**

Comment Text

8. Comment No. 1612 regarding the lack of discussion of lead as a contaminant of concern in CSM 3: this comment was made because there is no discussion of lead for CSM 3 in the RI, yet the FS focuses on alternative development for this area based upon issues related to lead-exposure to waterfowl and other wildlife; thus the RI does not seem to parallel or provide nature and extent data useful to support the FS. The response was: "The nature and extent section are intended as data reports. A detailed discussion of results of all 18,000 samples was not within the scope of this evaluation." A detailed discussion of all sample results was not requested. The guidance for CERCLA RI/FS documents does not indicate that the RI is a "data report", but the documentation of nature and extent of the contaminants of concern in support of the FS process. If the primary contaminant of concern as identified in the ecological risk assessment for CSM 3 is lead, then we recommend that the nature and extent of lead in CSM 3 be discussed in the RI.

Response Text

Lead is clearly presented in Sections 4.1 and 5.2 and in supporting data tables as being a contaminant of concern. Concentrations in sediment greater than 100 times the screening levels are clearly identified.

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0-Comment Pertaining to Entire Document

2376 Draft — **233**

Comment Text

3. Several of our previous comments (e.g., Nos. 1360, 1390, 1459, 1465, 1623, 1861, 1876, 1894) asked for presentation of probabilistic values using range brackets or confidence intervals rather than single numbers or "expected values." This is consistent with the use of a probabilistic approach where by definition of a quantified level of uncertainty is associated with the model's predictions. In general, the response has been to make editorial changes such as removing the values from the text, or rounding to two significant digits; in some cases, the coefficient of variation was added in parenthesis. We are concerned that use of expected values without such an indication of the variation will be misleading to readers who do not have the time or possibility to familiarize themselves with the probabilistic approach, and may be taken in the future to be firm or absolute values.

Response Text

The coefficient of variation has been added to summary tables of the estimated expected values to give the readers reference for the associated uncertainty. Showing "range brackets" on figures or "confidence intervals" in tables would be redendent with the coefficient of variation. Note that the coefficient of variation is a standard statistical term used to show uncertainty or variability and does not require the reader to understand the probabilistic approach in great detail.

2377 Draft — **234**

Comment Text

4. In several instances (e.g., comments Nos. 1358, 1516, 1574, 1575, 1612, 1627, 1872), the responders declined to clarify various issues regarding interpretation of the data, stating that the RI is a "data report" and that "a detailed discussion of results of all 18,000 samples [from the basin] was not within the scope of this evaluation." It was not our intention to ask for a sample by sample description; however, we believe more interpretation of the data would provide useful information for FS alternative development.

Response Text

Given the size of the study, data have been integrated for interpretation using the probabilistic modeling and focussed analyses have been done in separate Technical Memorandums.

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0-Comment Pertaining to Entire Document

1960 Draft — General — 121

Comment Text

It was noted that the hard-copy text did not always match up exactly with the text on the CD-ROM (i.e., the text at the beginning or the end of a page was not always the same for the hard-copy as that for the CD-ROM version). The page, paragraph, line, or sentence referred to in our comments reflect the locations in the hard-copy.

Response Text

This is a recognized error introduced by the software that converts word processed files into the Adobe Acrobat pdf format.

1961 Draft — Glossary — 122

Comment Text

Ecological receptors - should be revised to include - "Ecological receptors can be or are representative of many other species, guilds, etc."

PRG - definition given varies somewhat from how it is defined in the text of the Ecological Risk Assessment, suggest using definition given on Pg. ES-3 or Section 5.0 of the Ecological Risk Assessment.

Response Text

The suggested revision about receptors does not seem appropriate, but definition modified by adding "Ecological receptors chosen for evaluation in the ecological risk assessment may represent hundreds of similarly exposed species in the Basin."

PRG definition replaced by using the following (modified) text from EcoRA p. ES-3: "Concentrations of contaminants (i.e., mining-related hazardous substances) that would result in acceptable levels of risk (including no risk or risk within defined limits) for human or ecological receptors, and the physical habitat conditions that would be conducive to recovery of the affected receptor populations (see also remedial goal)."

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1962 Draft — Section 3.0 — 123

Comment Text

Note: there seems to be some general problems with the citations of Stratus in Part 1, and especially in Section 3 of Part 1. These problems are outlined below (and in some of the specific comments):

-Much of the information cited as Stratus (1999), when referring to the "Report of Injury Assessment," has a factual basis tied directly to other publications that should be cited instead.

-When a statement is in fact referring to the "Report of Injury Assessment", the reference needs to be updated to "Stratus 2000" and remove the word "Draft" from the title (e.g., see comment for Pg 347 below). The updated reference should be:

Report of Injury Assessment and Injury Determination: Coeur d'Alene Basin Natural Resource Damage Assessment. 2000. Prepared by Stratus Consulting, Inc., Boulder, Colorado, for the U.S. Department of the Interior, Fish and Wildlife Service, U.S. Department of Agriculture, Forest Service, and the Coeur d'Alene Tribe. September 2000.

-There are two common references to Stratus in Section 3: "Stratus 1999" and "Stratus 1 999a". There is no "Stratus 1999a" in the reference section for section 3. Please ensure that the correct reference is used when referring to the Stratus study that is currently in this reference section (i e , the "Fish Population Monitoring" study).

Response Text

Citations revised as appropriate.

1963 Draft — 124

Comment Text

Pg 3-47 1st par of Section 3.6; the reference for "Stratus 1999" needs to be updated to "Stratus 2000" here and throughout the document

Response Text

Reference updated.

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1964 Draft — **125**

Comment Text

Pg 3-50 1st par, last sentence; the "Stratus 1999a" reference is incorrect. The sentence is describing the study by D.F. Woodward et al. and should be cited:

D.F. Woodward, J.N. Goldstein, A.M. Farag, and W.G. Brumbaugh. 1997. Cutthroat Trout Avoidance of Metals and Conditions Characteristic of a Mining Waste Site: Coeur d'Alene River, Idaho. Transactions of the American Fisheries Society 126:699-706.

Response Text

Reference revised.

1965 Draft — Section 6.0 — **126**

Comment Text

Also note on Pg 6-20 that the Woodward et al. 1997 reference is missing "W.G. Brumbaugh" in the byline. The correct citation is written above.

Response Text

Reference authorship corrected.

1966 Draft — **127**

Comment Text

Pg 3-50 4th par; there is an editorial problem with the "Funk, Rabe, Filby, Parker, et al. 1973; Funk, Rabe, Filby, Bailey, et al. 1973;" reference. They should be Funk et al. 1973a and Funk et al. 1973b.

Response Text

The references are stated this way for clarity. No change made.

1967 Draft — **128**

Comment Text

Pg 3-51 4th par; the "Stratus 1999" reference is incorrect. The sentence is describing the study by D F. Woodward et al. and should be cited:

D.F. Woodward, J.N. Goldstein, A.M. Farag, and W.G. Brumbaugh. 1997. Cutthroat Trout Avoidance of Metals and Conditions Characteristic of a Mining Waste Site: Coeur d'Alene River, Idaho. Transactions of the American Fisheries Society 126:699-706.

Response Text

Reference revised.

1968 Draft — **129**

Comment Text

Pg 3-52 2nd par, last sentence; Is it correct as stated that macroinvertebrate "abundance, total biomass, taxa richness, and mean diversity were positively correlated with zinc concentration in water."? If so, please explain. Is this sentence describing the Coeur d'Alene Lake or Priest Lake?

Response Text

Results are for Coeur d'Alene Lake. Following text added to paragraph: "However, because Ruud provides no quantitative estimates of the effects of metals on the benthic community of Coeur d'Alene Lake and there is a potentially high "false positive" error rate among Ruud's 306 correlation analyses, no definitive conclusions can be drawn from his work regarding the potential impact of metal concentrations in the lake on benthic macroinvertebrates."

1969 Draft — **1210**

Comment Text

Pg 3-53 2nd par, last sentence; Campbell et al. 1998 should be Campbell et al. 1999.

Response Text

Reference revised.

1970 Draft — **1211**

Comment Text

Pg 3-54 last par; Replace "slickers" with "slickens."

Response Text

Text revised.

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1971 Draft — **1212**

Comment Text

Pg 4-1 3rd par; It is stated that U.S. Fish and Wildlife Service data sets were utilized for the remedial investigation, and that these sources are listed in Table 4.1-1. These sources are not listed in Table 4.1-1.

Response Text

Reference to US FWS data removed.

1972 Draft — **1213**

Comment Text

Pg 5-4 3rd par, last sentence; The text "in soils and rocks over mineral stocks" is repeated twice.

Response Text

This section on background has been substantially revised and no longer contains this sentence.

1973 Draft — **1214**

Comment Text

Pg 5-9 3rd par; Change "lead, 35,8" to "lead, 35.8"

Response Text

This section on background has been substantially revised and no longer contains this sentence.

1974 Draft — **1215**

Comment Text

Pg 5-11 3rd par; It is stated that the " ambient water quality criteria calculated at a hardness f30 mg L as CaCO3 are shown in Table 5.2-10." The Table in question does not state that this hardness is used. The next two sentences in this paragraph are somewhat misleading. It is stated that "A hardness concentration of 30 mg/L is toward the lower end of the range for the mining-affected portions of the Coeur d'Alene basin. More than 25 percent of the samples used to calculate background for the entire South Fork had a hardness concentration greater than 30 mg/L." These sentences imply that a hardness value of 30 mg/L is on the low side for calculating ambient water quality criteria (AWQC). On the contrary, if 25 percent of the samples are greater than 30 mg/L, then 75 percent of the samples are less than 30 mg/L, indicating that the basin, as a whole, has very low hardness. One of the major problems of metals-contamination in this basin is the low hardness values. It is well documented that the toxicity for many metals is inversely proportional to hardness concentration. As hardness goes up, toxicity goes down. Thus, there is the need to calculate AWQC based on hardness values. A hardness value of 30 mg/L (or lower) is appropriate for calculating AWQC in this basin.

Response Text

The hardness value of 30 is stated in a footnote to new Table 5.1-2 and was in a footnote to old Table 5.2-10.

1975 Draft — **1216**

Comment Text

Pg 6-18 The Campbell reference is incorrect. Need to add "L.L. McDonald" as the last coauthor; change 1998 to 1999; and change "Draft" to "Final Draft"

Response Text

Reference revised.

7-Summary

1976 Draft — **1217**

Comment Text

Pg 5-6 through 5-9, and possibly elsewhere; Table 5.3.4-1 is erroneously referred to as Table 4-1.

Response Text

Table 4-1 is the correct table as it contains, estimated expected concentrations, loads, and discharges at the 13 locations.

1977 Draft — **1218**

Comment Text

Fig 5 3.5-6 Based on the "Total Lead Mass Loading" of 156 lbs/day at the Spokane River Below CDA Lake (SR50) site, the "dot" should be much bigger than the one shown. Same comment for Figure 5.3 5-7.

Response Text

Correct. Dot on figures at referenced location (SR50) enlarged to be consistent with legend.

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*** No Watershed ***				
0-Comment Pertaining to Entire Document				
1659	Draft	Appendix G	516	
Comment Text		p. G-11		**Response Text**
Page G-11, appendix G 5, 2nd paragraph states: "Phosphate was not included in these solution analyses and therefore possible precipitation of phosphoric forms of lead could not be evaluated." Why wasn't phosphate included in these tests? Is not phosphate the limiting factor regarding nutrients in the lake? I find this ommission curious if not ominous.				Phosphate was not always analyzed in surface waters of the CdA basin because loadings of lead, zinc, and cadmium were of primary concern in these areas and analyses were focused on these contaminants. Phosphate becomes more of a concern in CdA Lake because of possible eutrophication in the lake and phosphate levels in the lake have been analyzed and studied. Some samples collected from surface waters in the basin were analyzed for phosphate to obtain information on phosphate levels.
1660	Draft	Appendix G	517	
Comment Text				**Response Text**
Regarding University of Idaho work on the mission flats with peisometers. Please be advised that during most months of the year, the U of I technician found no moisture in these peisometer holes (personal _____).				The information contained in the comment is appreciated. Thank you.
1661	Draft	Appendix G	518	
Comment Text		p. G-2		**Response Text**
appendix G.3, fourth paragraph: Kd values "…—does not account for well established variation of Kd with soil type." Are these soil types the same as those used by NRCS-USDA in their soil survey of Kootenai County? Your Kd values should be keyed to these already established, named and described soil types done by soil science professionals.				Various Kd values for lead, cadmium, zinc and other metals were taken from the literature and others were developed as part of this study. Obviously, some of the Kd values referenced in the literature were not developed from exactly the same soil types as those found in the CdA basin though an effort was made to select Kd values from similar soils. However, collocated samples in the CdA basin were identified to obtain in-situ Kd values. The samples identified were collected in December 1998 coincident with the installation of monitoring wells. The Kd values developed using these samples, clearly, were with the soils found in the basin. Therefore, the in situ Kd values calculated as part of this study used soils and waters of the basin and are considered representative.
1-Setting and Methodology				
1644	Draft	3.6.6	51	
Comment Text		p. 3-54		**Response Text**
On page 3-54 of 3.6.6, the term for Coeur d'Alene (CDA) River valley soils upon which heavy metals enriched sediments have been alluvially deposited is SLICKENS, not SLICKERS as it is spelled in your report. Please reference my "Guide to Reclaiming Heavy Metals Contaminated Soils in the Coeur d'Alene River Valley" for this term, plus information describing the CDA River valley soils under your Agriculture heading. Actually, as you can see in the synopsis of my "Guide..." which you are quoting, this information comes from the USDA Soil Conservation Service (now NRCS) Soil Survey Manual for Kootenai County which I clearly referenced in the same paragraph. Please give the _____ information, not me. Also this heavy metal alluvium came from mine tailings, not mill tailings, according to the SCS Soil Survey Manual.				"Slickers" replaced with "Slickens" Frutchey 1994 already included as the reference for this term. USDA Soil Survey for Kootenai County (1981) included as reference for this section. Mill tailings changed to mine tailings.
1645	Draft	3.6.4	52	
Comment Text		p. 3-53, 3-54		**Response Text**
On pages 3-53 and 3-54 of 3.6.4, regarding information you obtained from Stratus (1999) your EPA report mentions no information about the obviously more vigorous plant growth performance on the several hundred acres of heavy metals contaminated soils which have been rehabilitated over the past twenty-five years by landowner/managers in the CDA floodplain. Why not? In other words,				Text added to include information on soil amendment studies performed by private landowners.

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your report describes plant growth retardation as an effect of heavy metals, but makes no mention of large scale successful actions in the basin to reverse this deleterious affect. It would seem to me to be more accurate to describe ecological conditions as they are now, with at least some degree of hope for remediation, rather than to dwell only on negative influences.

In fact, nutrient deficiencies retard plant growth here in my experience more than anything else. Phosphate fixation by _____? zinc (Zn) will inhibit plant growth causing classic deficiency symptoms for phosphate where Pb and Zn concentrations in the soil are elevated. Pb and Zn toxicity (i.e., too much of these elements in the soil) has not been exhibited in the lower CDA River valley by the plants that naturally grow here, except in isolated spots, in my experience.

A similar phenomena is echoed when measuring growth of cattle grazing on these indigenous grasses. In spite of the fact that soils tested for total content of copper (Cu) and manganese (Mn) indicate that the heavy metals affected soils contain relatively high concentrations of these elements, I have found it necessary to supplement both Cu and Mn in addition to other trace minerals in order to achieve thrifty growth of cattle. This supplementation is accomplished and controlled via the salt (NaCl) mixture. In other words, it is not whether animals are receiving detrimental elements from these soils, but rather it is what they are not getting enough of from these soils (i.e., low bioavailability). Upon closer inspection I believe that EPA scientists would find the same phenomena to be occuring in wild animals as often as not.

Please do not misunderstand. I seek no notoriety in this matter. The forces of nature (ie: sedimentary deposits of clean natural erosion materials) have done more over a larger area than my wife and I have done to enhance plant growth, improve soil health, and increase bio-diversity here. Also I am well aware that neither fame nor infamy will gain me anything at the supermarket. Therefore the EPA may take credit for any improved condition if it suits them as far as I'm concerned. I only ask that your report be accurate and document both positive as well as negative influences.

Additionally, soil amendment pilot studies are in the planning stages. The pilot studies will test the effectiveness of potential low cost soil amendment remedies.

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1646	Draft	Glossary	53

Comment Text

In your glossary of terms:

Agriculture crops should include grass seed production (another sod forming crop).

I find no term to describe affected landowner/managers.

Mill tailings are not defined.

Mine tailings are not defined.

There is no definition of heavy metals, specifically Pb, Zn, and Cd, all of which are naturally occuring elements (see Atomic Chart in any basic chemistry text).

There is no description of toxic dose; perhaps a separate paragraph explaining toxicity in addition to EPA terms such as "background" amount, drinking water standards and "Gold Book" tolerances would be in order. Nothing in nature is ever completely pure, such as distilled water in a sterilized beaker might be. Without basic nutrients (N, P, K) plus trace minerals (Fe, Cu, etc.) there is of course no life.

Response Text

Glossary revised to add applicable terms.

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1648	Draft	1.2.4.12	55	
Comment Text		p. 1-15		**Response Text**
Also on Eagle Creek, no mention of early clean up actions (early 1980s) by the Kootenai/Shoshone Soil Conservation District, in cooperation with USDA-NRCS, the USFS and our local Army Guard Unit. This work at the Jack Waite Mine was instigated by SCD chairman Warren Van and supervisor Lavern Reffolt.				See response to comment #1645.
1649	Draft	1.2.4.12	56	
Comment Text		p. 1-14		**Response Text**
Your report also mentions that only 10% to 30% of the total Pb is in the dissolved form. Would it not then follow that only 10% to 30% of the total Pb measured is likely to be bio-available? (The threat to wildlife therefore reduced?)				Lead does not have to exist in the dissolved phase to be bioavailable. Adsorbed and solid-phase forms of lead are also bioavailable. Adsorbed and solid-phase forms have caused mortalities in tundra swans. The adsorbed form of lead (constituting 70 to 90 percent of the total lead in surface waters) may be attached to solid phases such as iron oxides (ferric oxhyhydroxides). This adsorbed lead can be released in the acid environment of the stomach through exchange reactions (hydronium ions substituting for metal cations) and dissolution of the iron oxyhydroxides which are soluble in the low-pH environment of the stomach. Additionally, Ruby (1999) indicates that iron-lead oxides, and lead sulfates have moderate bioavailability, while lead carbonates have a high bioavailability. All of these are solid phases. Ruby, M.V., R. Schoof, W. Brattin, M. Goldade, G. post, M. Harnois, D. E. Mosby, S. W. Casteel, W. Berti, M. Carpenter, D. Edwards, D. Cragin, and W. Chappell. 1999. Advances in Evaluating the Oral Bioavailability of Inorganics in Soil for Use in Human Health Risk Assessment. Environ. Sci. Technol. 33, (21) 3697-3705.
1650	Draft	2.1	57	
Comment Text		p. 2-3		**Response Text**
2nd paragraph states: " ...deposition of Pb in soil by floodwaters causes hazards to wildlife." Why no modifying comment comparing the habitat as it was seventy years ago (as _____ condition we see here now?				Our main objective is to describe conditions as they currently exist. It has been demonstrated that ingestion of lead is currently a hazard to waterfowl. "Modifying comments" are presented in the discussion of the site history.
1651	Draft	2.1	58	
Comment Text		Fig. 2.1-2		**Response Text**
Figure 2 1-2 diagrams sources of metals by various disturbances. I am baffled that you list resource management as a primary stressor that increases nutrients to streams by altered soil productivity. Is there then no such thing as "good" resource management? Good management of sod forming grasses in a floodplain lessens soil erosion, acts as a sediment filter and is a phosphate reservoir (see my "Guide--…" which you reference, plus the "Coeur d'Alene Cooperative River Basin Study" conducted by USDA-SCS, USFS, and the Kootenai/Shoshone SCD which you also mention _____ in your report. In other words, wise management of _____ and resources in the CDA floodplain promotes better heavy metals fixation, and achieves more comprehensive soil erosion more quickly than that which occurs naturally, not visa versa. Human activities really can result in ecological improvement as well as in degradation. Isn't this why we have departments of ecology, USFWS, Soil Conservation Districts? Idaho Dept. of F&G HIP programs, to say nothing of the EPA itself? Figure 2.4-1 is similarly erroneous in only focusing on possible detriments.				As indicated by the comment, the objective of the referenced figures is to illustrate sources of metals, not to indicate operations or practices that mitigate metal concentrations. Mitigation of metal concentrations is addressed in the Technical Memoranda on treatability studies, conceptual designs of treatment systems, and revegetation in the basin.

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1-Setting and Methodology				
1652	Draft	2.4	59	
Comment Text		p. 2-15		**Response Text**
Concerning page 2-15 in 2.4, please be aware that both the Idaho Dept. of Fish and Game Wildlife Management Areas, as well as private farmed areas have treated heavy metals soils upon which raptors, associated species, plus waterfowl etc , species now protected. This condition started to noticeably improve in the early 1980s.				We are aware of the extensive efforts by private landowners and various State Agencies in Idaho to treat and decrease the mobility and bioavailability of metals. We have in the past and in the future will acknowledge and consider these efforts in implementing any remedial plan for the basin.
1653	Draft	2.4	510	
Comment Text		p. 2-15		**Response Text**
To further clarify how Pb is stabilized by dense plant growth, and not accumulated, or translocated to any significant extent in above ground growth, please refer to a diagram depicting phytostability ("Land & Water" magazine, July/Aug. 2000 issue by Wm Morgante, Plant & Soil Scientist). Also you could refer to EPA's "A Citizen's Guide to Phytoremediation."				Lead may be stabilized by dense plant growth, however, Stratus has summarized results of studies that show much of the poisoning of waterfowl results from direct ingestion of contaminated sediments. Text revised to include conclusions of the Stratus summary.
1654	Draft	3.6	511	
Comment Text		p. 3-18		**Response Text**
Page 3-18 of 3-6, first complete paragraph, last sentence: "The alkalinity added by the acquifer reduces the _____ . This is true also when resource managers use liming agents to raise the pH on the land. (Another example of good soil management resulting in an improved ecological condition).				That is correct. Increased alkalinity will reduce ecological impacts of metal toxicity whether the increased alkalinity comes from the aquifer or from agricultural liming. It is not necessary to change the wording of the text.
1655	Draft	3.6.2	512	
Comment Text		p. 3-51		**Response Text**
last complete paragraph: How do you know? Which agricultural fields have been documented as nutrient contributors, how much and what nutrients? I see no data in this regard. Are you implying our conditions growing perpetual sod forming grasses is the same as row cropping in the mid-West?				As indicated in the referenced paragraph, this is a quote from Woods and Beckwith (1997). No independent studies were carried out. In general, any time there is an application of nutrients, some portion of nutrients in that application will reach groundwater. This is particularly true for nitrates. This is not to imply that the same quantities of nutrients from farming practices in the CdA basin will reach groundwater or surface water as in row cropping areas of the Midwest. In general, higher nutrient applications are expected in the Midwest compared to grass farming in the CdA basin. Therefore, higher quantities of nutrients are expected to enter water bodies in the Midwest compared to the CdA basin. Nevertheless, it is expected that with any nutrient application, a portion of that application will be lost to water bodies. As nutrients are applied to grasses in the CdA basin, a portion of those nutrients will enter the water bodies (e.g., surface and groundwaters). The referenced statement is correct.
1656	Draft	3.6.4	513	
Comment Text		p. 3-54		**Response Text**
last paragraph: "…—as soil metal concentrations increase, plant growth decreases." _____ the pH is raised and phosphate and/or organic matter is added; then plant growth can be revitalized. I could find no test results for the garden produce you sampled. Where is it?				The reviewer's comment is correct. Increasing the pH through liming concurrent with additions of phosphate and /or organic matter has the potential to "revitalize" plant growth. This does not affect the accuracy of the statement in the referenced paragraph, however. Results for the plants sampled are in Stratus 1999.
1657	Draft	5.4	514	
Comment Text		p. 5-15		**Response Text**
Page 5-15 of 5.4; also figure 5.1: Since Pb, Zn, and P2O5 all had positive fluxes from benthic sediment, _____ in				Contrary to the assertion in the comment, forms of Pb, Zn, and P2O5 from benthic

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forms insoluble in water, what affect does phosphate have on dissolved Pb and Zn?

sediments were in soluble forms. However, reaction with other materials, for example, iron oxyhydroxides, tends to immobilize the metals and remove them from solution. Phosphate will form relatively weak aqueous complexes with Pb and Zn.

1658 Draft — 5.4 — **515**

Comment Text — p. 5-15

Also no mention of affect metals have (especially Zn) on the incidence of toxic algae blooms. Seems as though I have seen reference by Dr. Paul Wood, USGS, regarding the likelihood of algae blooms in CDA lakes, because of the modifying influence of Zn.

Response Text

The comment is correct. The effect of elevated zinc concentrations on algal bloom is addressed in the discussion on CdA Lake. In general, elevated zinc concentrations are thought to suppress algal bloom.

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1647 Draft — 1.2.4.12 — **54**

Comment Text — p. 1-15

Again, no mention of clean up actions by private land owners, or the local "Save Our River Environment" (SORE) group, which is a long standing, hands on environmental group dedicated to protecting the CDA River and associated environs during the past fifteen years. The visible results of private efforts on several hundred acres in the CDA _____ joint investigation you mention by the Mine Owner's Assoc., the University of Idaho, IDEQ, and the EPA in 1998 to assess the effectiveness of these methods which your report says "… resulted in decreased leachability of both Pb and Zn…"

Response Text

Text modified to reflect comment. Not all the elements mentioned by the reviewer could be documented at this time.

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2213 Draft — **161**

Comment Text

One of the most pervasive problems in the section is the misuse of the word "metal." Metal is not defined in the glossary of terms. In the U.S. Bureau of Mines Dictionary of mining, mineral and related terms, metal is defined "an opaque, lustrous, elemental, chemical substance that is a good conductor of heat and electricity and, when polished, a good reflector of light." The definition goes on to describe other characteristics of metals including the definition that a metal is an elemental substance whose hydroxide is alkaline.

The use of "dissolved metal" or "dissolved zinc" is also very misleading. Dissolution is a process of going from a solid state to a solution state. This usage very clearly implies that elemental metal was dissolved, which is almost never the correct origin of metallic ions.

See page 1-1. "These mill tailings contained metals, such as cadmium, lead, and zinc." This is absolutely incorrect. The word metals should be replaced with "metallic minerals" or "metallic compounds." The names of the elements should be changed to the name of the minerals.

The improper usage of the word "metal" should be revised throughout the document.

Response Text

"Metal" defined in the glossary of terms.

We fail to see the point with the metal definition. This particular definition provided applies to zinc, lead, and cadmium. For example, these metals form hydroxides under alkaline conditions. Other definitions could also be used such as those relating to crystalline structure in "Advanced Inorganic Chemistry" by Cotton and Wilkinson.

The reviewer's definition of dissolved is incorrect. Dissolved is an operational definition that refers to the ability to pass through a 0.45 micron filter. This is the common usage of the term.

Saying the tailings contain metals is correct usage. Those metals, of course, exist as various minerals and solids in the tailings. The types of mineral and solid forms the metals exist in are defined elsewhere in the RI.

Metal is used correctly. There is no need to revise it. Please refer to metal definitions in Advanced Inorganic Chemistry by Cotton and Wilkinson. The metal definitions apply to zinc, lead, and cadmium which are the focus of discussion in the RI.

2214 Draft — **162**

Comment Text

On page 1-2 and throughout document, I think the use of the word "threat" is pejorative.

Response Text

Comment noted.

2215 Draft — **163**

Comment Text

Page 1-3. Grand Coulee dam is certainly not "along the Spokane River."

Response Text

Text corrected as per comment.

2216 Draft — **164**

Comment Text

Page 1-4. Mining began with the discovery of gold [not silver] in the Prichard Creek area.

Response Text

Text corrected as per comment.

2217 Draft — **165**

Comment Text

Page 1-4 and 1-5. The quote from Long says "Pulverized material was mixed with water..." This is not correct. Ore is not pulverized dry and then mixed with water; it is ground as a slurry. Also in the quote is the improper usage of elemental names. It is very doubtful if tailings assayed as much as 10% lead or zinc because the average grade of the ore in the district is less than that. Long's description of mining practices is very poor. Sulfide and oxide compounds of various minor metals are mentioned. I don't thick these oxide compounds have ever been identified. Gold doesn't form sulfide or oxide compounds, in general. Oxides are very limited in the district because of the limited permeability of the rocks and the high erosion rate.

Response Text

Early mills did include the dry crushing or "pulverizing" of ores prior to being "jigged." However, the text presented in the RI is intended as a general description of historic milling. As such, it does not detail all points at which water is introduced in the crushing, grinding and recovery ore or disposal of tailings. Uses of elemental names are appropriate in conveying to the reader which metals, not minerals are being discussed. Early mills in the basin were not efficient in recovery of ore minerals. The low recovery resulted in generation of jig tailings containing higher metal concentrations mentioned in the text. Regarding the presence of oxides being very

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limited due to limited permeability, mining conducted in the basin resulted in placement of mine dumps tailings piles, and mine waste mixed with sediments. These features have high permeabilities and are subject to weathering of the sulfide minerals.

2218 Draft — **166**

Comment Text

Page 1-5. There is not mention of the Cataldo Dredge. About 2/3 of the tailings discharged from the mineral processing plants were dredged from the river. The Cataldo Dredge was an ingenious operation located at a site where sediment was deposited and where there was a large area available for sequestering the tailings. By not mentioning the dredging operation a very slanted view is put forth. Following is a table which shows the disposition of material mined. Please see information below, entitled: PRODUCTION AND ESTIMATED MASS BALANCE - COEUR D'ALENE MINING DISTRICT TO 1998.

Response Text

As summarized by Chamberlain and Williams, 1998: The Cataldo Flats are covered by tailings and sediments that were deposited by, or dredged from the LCDAR. Dredge spoils were deposited to depths of up to 40 feet during the period from the late 1800s until the 1930s. The dredge spoils cover an area of approximately 6,000,000 square feet to the northwest of the Old Mission Sate Park and on both sides of I-90." They conclude that concentrations of cadmium, lead and zinc in groundwater within the dredge spoils are high and that this groundwater is discharging to the LCDAR. Though at the time, this may have been a thought of as an effective treatment, the dredge spoils are a source of metals to LCDAR. Also, this section of the RI is intended to summarize recent cleanup actions in the basin.

2219 Draft — **167**

Comment Text

Page 1-6. "Tor educe" should be to reduce. Piling tailings on a football field is really goofy.

Response Text

Typo corrected. The analogy was developed to help the public get an understanding of the order of magnitude of tailings produced.

2220 Draft — **168**

Comment Text

Page 1-10. I don't believe anything has been removed from the Little Pittsburg site. This is not correct.

Response Text

Text modified as per comment.

2221 Draft — **169**

Comment Text

Page 1-13. I didn't see mention of channel work upstream of Elizabeth Park.

Response Text

Additional text has been added to section 1.2.4 9 describing channel work performed above Elizabeth Park."

2222 Draft — **1610**

Comment Text

Page 1-14. The section of river between the Theater and Bunker Hill Bridges is not between Pinehurst and Cataldo.

Response Text

The description of this removal effort within the Box removed from text.

2223 Draft — **1611**

Comment Text

Page 1-17. I-90 parallels the main stem below Kingston, not South Fork.

Response Text

The description of the location of I-90 on this page is accurate.

2224 Draft — **1612**

Comment Text

Page 1-18. Most of the Federal land close to the main rivers is BLM, not USFS.

Response Text

The text addresses ownership basinwide and is correct as written.

2225 Draft — **1613**

Comment Text

Figure 1.2-1. The Bunker Hill box is exactly E-W, not cattywampus. Woodland Park is not in the St. Joe. The boundary should

Response Text

The "Box" and Woodland Park locations revised as per comment. The St. Maries River

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not go up from Harrison toward St. Maries - water doesn't flow uphill.				is shown for reference and is not shown as being within the project boundary (dashed line).
2226	Draft		1614	
Comment Text				**Response Text**
Page 2-2. The Galena mine is on Lake Creek. Why would it be omitted?				As stated in the text, during the planning process for the RI, Lake Creek has "no indication of significant problems with ongoing releases of mining waste..."
2227	Draft		1615	
Comment Text				**Response Text**
Page 2-5. "Precipitation of metals", wow is there a new metallurgical process that we don't know about?				The definition of precipitation of metals, "the separation of a solid from a liquid solution", may be found in a basic chemistry textbook.
2228	Draft		1616	
Comment Text				**Response Text**
Page 2-6. I don't believe any restructuring has been done at the confluence of Big Creek and the South Fork. I live very close and I didn't see it happen.				The text regarding fish passage at Big Creek deleted.
2229	Draft		1617	
Comment Text				**Response Text**
Page 2-6. The Revett formation in upper Canyon Creek has disseminated galena. There is probably more galena in the Revett than in the combined veins in the rest of the district.				See response to Comment #2252.
2230	Draft		1618	
Comment Text				**Response Text**
Page 2-7. "Bed in segment 4 is bedrock.				Text agrees as stated.
2231	Draft		1619	
Comment Text				**Response Text**
Page 2-9. What does zinc have to do with human health?				No specific reference to human health occurs on this referenced page. Unable to address comment.
2232	Draft		1620	
Comment Text				**Response Text**
Page 2-10. There are fish in the South Fork. I am a fisherman and I know that. They are not just passing through because they are not carrying suitcases.				Yes, as stated in the text on the referenced page, there are fish in the Upper South Fork.
2233	Draft		1621	
Comment Text				**Response Text**
Page 2-11. What is a "natural river?" The word natural has no meaning.				The term is included to differentiate between portions of the South Fork reengineered to suit human purposes (e.g., "moved, channelized, armored, and otherwise altered") with portions of the South Fork in their free-flowing, "natural" or unengineered condition.
2234	Draft		1622	
Comment Text				**Response Text**
Page 2-12. Pounds should be changed to kilograms, and throughout document. The old channel of the South Fork has not even				For consistency throughout the RI, mass loading is reported in pounds/day.

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been noticed. It is almost as deep as the current channel from Big Creek to Pinehurst. Pine Creek also has an old channel.

This section of the document describes current conditions. Insufficinet data are available to give an accurate description of the location and configurations of the old river channels.

2235 Draft **1623**

Comment Text

Page 2-15. I assume the "lead-contaminated sediment" is from lead shot. The presence of lead compounds in certain plants such as horse tail is not mentioned here.

Response Text

This assumption is incorrect. The following text was added to clarify:

"Studies (summarized by Stratus 2000) have shown that lead in the sediment that causes mortality and other adverse health effects in wildlife is the result of upstream mining activities. Although some lead is bioaccumulated by plants and other food-chain organisms, much of the poisoning is a result of incidental sediment ingestion by wildlife."

2236 Draft **1624**

Comment Text

Page 2-15. What BS! The USGS has estimated that 75 million tonnes of metal contaminated sediment is in Lake Coeur d'Alene. The number could be made much larger if you use the entire earth.

Response Text

The USGS report with the calculated masses of metal-contaminated sediments in CDA Lake is Horowitz et al 1995; which is actually a journal article in Hydrological Processes. It is cited in the fate and transport section of the CDA Lake section of the RI. Horowitz goes through the rationale, caveats, and data sources used in the calculation. The independently calculated value compared favorably with earlier estimates and also compares well with more recent calculations by Art Bookstrom contained in Gearheart 1999.

2237 Draft **1625**

Comment Text

Page 2-15. Why is a hypothesis mentioned and not qualified? See the idea that lead minerals could be dissolved in a reducing environment.

Response Text

Comment unclear.

2238 Draft **1626**

Comment Text

Page 2-16. Again we have "lead as particles." I assume we are talking about lead shot.

Response Text

The types of particulate metals discussed in this report are described in Section 3.3.1.2: The majority of metals observed in sediment samples from this area are associated with particulates such as iron and manganese oxides, organic matter and silt/clays, not lead shot.

2239 Draft **1627**

Comment Text

Page 2-16. Up to 80-90% of "particulate metals" are retained by the lake, but yet the problem of a floating plume is emphasized. It can't be both ways. The plume should be greatly diminished toward the mouth of the Spokane River.

Response Text

Incorrect. The text on page 2-16 states: "..during periods of high flow in the CDAR, dissolved metals and some metals-contaminated particulates are carried to the Spokane River at the north end of the lake without mixing completely with lake water." The floating plume is the dissolved phase which "floats" due to temperature differences between the CDAR and the lake.

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Additionally, during normal flows, particulate materials settle out onto lake bed sediments.

2240 Draft — **1628**

Comment Text

Page 2-17. The fact that Coeur d'Alene Lake has a viable chinook salmon fishery is not even mentioned. Facts are confusing sometimes. I wouldn't be too sure that the Spokane River lacks primary sources of metal ions. What about sewage plants? Industrial and farm pollution?

Response Text

Incorrect. The last sentence on page 2-16 states: "The lake supports populations of aquatic life including several species of fish that provide recreational fishing.."

The focus of this RI is mine-waste contamination. In the Spokane River, though permitted (NPDES) discharges and non-point source metals sources are likely present, metals concentrations coming out of Coeur d'Alene Lake exceed NAWQC making the Lake by far the primary source of metals to the Spokane River. (See Washington State Department of Ecology, 1998. Cadmium, Lead, and Zinc in the Spokane River: Recommendations for TMDLs and Waste Load Allocations.) Text modified to include reference to other potential minor sources.

2241 Draft — **1629**

Comment Text

Page 2-18. The logic that high trout mortality is due to metals is poor. If you take a crickets legs off, he can't hear. Meganser ducks eat a lot of fish.

Response Text

Text revised to indicate the likely causes of mortality. The following text was inserted after the sentence that begins with "However, mortality studies . . ":

"Other mortality was attributed to post-spawning adult mortality, high zinc concentrations, elevated summer temperatures, and/or low summer flows."

2242 Draft — **1630**

Comment Text

Page 2-19. Hangman Creek brings in "clean sediment." Oh yeah? What is the definition of clean sediment?

Response Text

Text revised to refer to sediment with low levels of metals (see also response to comment by John Roland).

2243 Draft — **1631**

Comment Text

The flowcharts are absolutely horrible and un-readable.

Response Text

Figures revised for clarity.

2244 Draft — **1632**

Comment Text

Page 3-3. I have never heard of Coeur d'Alene Lake Ranger Station. It doesn't exist.

Response Text

The meteorological data were measured at the Interagency Fire Dispatch office at Hayden Lake. Text corrected.

2245 Draft — **1633**

Comment Text

Page 3-4, section 3.2. What are primary metals? Are those the ones with a valence of 1? In ore deposits terminology. anything in soil would be secondary.

Response Text

"Primary" removed from sentence.

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2246 Draft — Doc ID: 1634

Comment Text

Page 3-5. No mention of the Cataldo Dredge. Maybe it never existed.

Response Text

This section presents a discussion on the geomorphic setting of the Basin. A discussion on the Cataldo Dredge has been added to the Lower Coeur d'Alene River report and a figure showing the location of the tailings in the Cataldo flats area has been added.

2247 Draft — Doc ID: 1635

Comment Text

Page 3-7. Grand Coulee dam is on the Columbia River, by gosh.

Response Text

Text clarified.

2248 Draft — Doc ID: 1636

Comment Text

Page 3-8. All of the Prichard does not have disseminated sulfides. Oxidation is normally very shallow.

Response Text

Text modified to reflect that argillites in the lower part of the Prichard Formation contain sulfides.

2249 Draft — Doc ID: 1637

Comment Text

Page 3-8. Revett formation is not all quartzite. It has a lot of siltite and some argillite.

Response Text

Text modified to reflect argillite parting in present in the formation.

2250 Draft — Doc ID: 1638

Comment Text

Page 3-14. The association of the Gem Stocks to the mineralization in the Bunker Hill mine is a surprise to many geologists. Also, something is wrong with the relative abundance of lead and zinc production. Zinc should be about 1/2 of the lead number. See average grades of production from Bennett and Mitchell. Also, I think galena has been studied extensively, maybe not be the EPA because they have never heard of it.

Response Text

The idea of metal enrichment during remobilization possibly influencing the location of major ore shoots - in relation to intrusive activity was presented by the USGS in "Geochemical-Exploration Studies in the Coeur d'Alene District, Idaho and Montana," USGS prof. Paper 1116. In addition, as discussed by B.G. White, the timing of ore emplacement in the district is complex and probably not completely understood (White 1998). The reported lead and zinc production figures for the district vary depending on the source. However, the ratio of lead-zinc production appears consistant with the reference used in the RI.

2251 Draft — Doc ID: 1639

Comment Text

Page 3-15. There is extensive, disseminated galena in the northeastern part of the district. The Gold Hunter mine is in Wallace formation and it is one of the current mines. Veins are said to be deeply weathered. This is not true unless you consider deeply as ten meters or so. Remember, Noah Kellogg's jackass found galena on the surface.

Response Text

Text modified to reflect the disseminated galena and other sulfides associated with many of the ore bodies in the district. The Gold Hunter mine cuts through the Wallace, St.Regis and Revett formations. Information reviewed did not identify which formation is currently being mined. Veins are weathered deeply - 10 meters would be considered deep regarding effects on the overlying soil concentrations. Regarding Noah's jackass, while some weathered galena may be found at the surface, the lack of surface mining of veins in the district (except in limited instances following the initial ore discovery) indicates that the metal content in veins at the surface was low - probably weathered.

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Draft
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Fred W. Brackebusch, P.E.

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	* No Watershed *			
1-Setting and Methodology				
2252	Draft		1640	
Comment Text				**Response Text**
Page 3-16. Galena is abundant in Revett formation above Burke.				Agreed. As stated on page 3-15, galena is the most abundant ore in the district and the Revett quartzite accounts for approximately 75 percent of the historical ore production.
2253	Draft		1641	
Comment Text				**Response Text**
Page 3- 17. The Star-Morning mine does not have vertical zonation. It has zonation from west to east.				According the White, 1998, there is vertical zonation in the Star-Morning Mine.
2254	Draft		1642	
Comment Text				**Response Text**
Page 3-18. Bacteria have a lot to do with oxidation of sulfides and are not even mentioned.				A discussion of the specific oxidation mechanisms are not included in this section to keep the presentation at an understandable level for the reader.
2255	Draft		1643	
Comment Text				**Response Text**
Page 3-20. Third paragraph intimates that most metallic minerals and metal ions move through Coeur d'Alene Lake whereas in other parts of the document, 80-90% are said to stay in the Lake.				Incorrect. The text on page 3-20 states: " A portion of the dissolved and particulate metal load moves through Coeur d'Alene Lake and enters the Spokane River."
2256	Draft		1644	
Comment Text				**Response Text**
Page 3-20. The migration of metals in sediments of the lake is fanciful, but I doubt there is any data to support it. I don't see any references.				Site specific studies conducted by the USGS are discussed (and referenced) at the end of this section on Page 3-21.
2257	Draft		1645	
Comment Text				**Response Text**
Page 3-24. The Cataldo flats is not mentioned as one the largest tailings sequestrations.				Text added to page 3-29 on the Cataldo Flats groundwater/surface water interaction study by Chamberlain and Williams.
2258	Draft		1646	
Comment Text				**Response Text**
Page 3-31. Osburn not Osborn. Also page 3-45.				Typos corrected.
2259	Draft		1647	
Comment Text				**Response Text**
Page 3-49. It says that the most heavily impacted areas of the South Fork are devoid of all fish. This is not true, even if the fish are just passing through with their suitcases.				It is true that the most heavily impacted areas are devoid of fish. However, the words "of CSM Unit 1" have been added to the first bullet to clarify.
2260	Draft		1648	
Comment Text				**Response Text**
Page 3-52. No mention of Chinook salmon. Truth is sometimes not convenient.				Assuming this comment is intended to relate to the list of native species in Coeur d'Alene Lake, it is not accepted because the Chinook salmon is considered to be an introduced species rather than a native species (Stratus 2000).

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1-Setting and Methodology				
2261	Draft		1649	
Comment Text				**Response Text**
Page 3-52. Total biomass, taxa richness and mean diversity correlate positively with zinc ion concentration. It looks like we need more zinc.				The following text has been added to temper the implication: "However, because Ruud provides no quantitative estimates of the effects of metals on the benthic community of Coeur d'Alene Lake and there is a potentially high "false positive" error rate among Ruud's 306 correlation analyses, no definitive conclusions can be drawn from his work regarding the potential impact of metal concentrations in the lake on benthic macroinvertebrates."
2262	Draft		1650	
Comment Text				**Response Text**
Figure 3.4-3. Old river channels are not shown.				This figures shows the locations of vertical hydraulic gradients in groundwater and is not meant to illustrate locations of old river channels.
2263	Draft		1651	
Comment Text				**Response Text**
Page 3-70. Detection limits should be noted, because the data for zinc is totally worthless due to a detection limit of 200 ppm.				The detection limit for zinc reported by Gott and Cathrall (data set summarized in this Table) is 25 mg/kg, not 200 mg/kg. No qualification necessary.
2264	Draft		1652	
Comment Text				**Response Text**
Page 3-71. Mercury analyses were incorrect in Gott's report.				Without additional information or references, this comment cannot be responded to.
2265	Draft		1653	
Comment Text				**Response Text**
Page 4-31. Task 5. What does the text have to do with metal speciation? Nothing.				This section presents descriptions of sample collection activities conducted for the RI. Metals speciation data were collected as part of USGS Task 5. See the referenced citation: USGS 1999.
2266	Draft		1654	
Comment Text				**Response Text**
Page 5-8. A careful reading of Gott and Cathrall shows that there are many errors and problems associated with the study, especially with respect to using the data for environmental purposes. Detection limits are too large; zinc is 200 ppm. When a metal is below detection, a zero value is assumed. The estimated background level for lead is 7.5 to 149 ppm. This is not really a useful estimate at all.				The background section has been significantly revised to include background ranges for the upper CDAR Basin, lower CDAR Basin, and the Spokane River Basin. Text and tables in this section have all been replaced.
2267	Draft		1655	
Comment Text				**Response Text**
Page 5-10. Silver at 3.1 to 5.5 ppm is very high.				See response to Comment #2266.
2268	Draft		1656	
Comment Text				**Response Text**
Mass flow calculations are based on poor sampling. Following is an average calculation based on geological data.				Mass loading calculations are based on measured concentrations and discharges.

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GIVEN

One ton of rock has a volume of 12 cubic feet.

Area of Coeur d'Alene Mining District is 300 square miles within the South Fork drainage.

Fluid inclusion data and geologic age dating data show that the average erosional rate has been 0.0075 inches per year over the last 80 million years.

Average lead concentration in rock [from Gott & Cathrall] is 178 ppm.

Average zinc concentration in rock [based on mean from Gott and Cathrall and revised for samples below the detection limit] is 240 ppm.

ASSUMPTIONS

The vertical erosion rate will average the same in the future as it has in the last 80 million years, which is 0.0075 inches per year.

CALCULATED

The average lead flowrate down the river would be 427 pounds per day.

The average zinc flowrate down the river would be 576 pounds per day.

The average sediment flowrate down the river in the South Fork at Enaville would be 1,200 tons per day.

Calculated by: Fred W. Brackebusch, P.E.

2269 Draft **1657**

Comment Text

Page 5-25. The largest discharges do not occur in the spring and summer. They always occur in winter.

Response Text

The greatest precipitation occurs in winter. The largest discharge occurs in spring and summer (see Canyon Creek Figure 2.3-1 which shows precipitation and discharge data for Water Year 1999).

2270 Draft **1658**

Comment Text

The probabilistic model sounds a lot like the climate models, and probably just as inaccurate.

Response Text

The reviewer is invited to read the Tech Memo on the probabilistic model to gain an understanding of the model. The Tech Memo has been included as part of the Administrative Record.

2271 Draft **1659**

Comment Text

Page 5-38. A two year sample is certainly not adequate for calculating the mass flow of sediment.

Response Text

Available data are used, recognizing the inherent uncertainty in using a limited data

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set. The probabilistic model, based on measured data, accounts for this uncertainty.

2272 Draft — **1660**

Comment Text

Page 5-71. Did the investigators actually look at the detailed data from Gott and Cathrall or did they just read the PP? There are many errors in the PP.

Response Text

See response to Comment #2266.

2273 Draft — **1661**

Comment Text

Page 5-72. Your investigators should look in Military and Sonora gulches to find huge Pb anomalies in the Revett formation and soils.

Response Text

See response to Comment #2266.

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Ivan Linscott

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Canyon Creek

2-CSM Unit 1, Upper Watersheds

1900	Draft	5.0	93

Comment Text

Volume 2, of the RI constructs the basis for the CSM by describing the geology, sediment and transport processes in Canyon Creek. Next in Volume 2, the sources and nature of contamination are discussed, and a description of the "fate and transport" of the contamination is transformed into an analytic description of the metals concentration, and the metals loading, in the creek. This analysis is presented in Section 5.5, as indicated in the section's opening paragraph.

5 5 MODEL RESULTS
Results from the probabilistic model are presented for cadmium, lead, and zinc in this section. Modeling results for estimates of discharge are discussed in Section 5 5.1. Modeling results for estimates of concentrations and mass loading of zinc, lead, and cadmium are discussed in Sections 5.5 2 through 5 5.4. Data and associated calculations are included in Appendix C.

Looking at the estimates for zinc concentration, I find in Figure 5.5-6, data are presented of measurements done in Canyon Creek at a variety of flow rates. There in the data is an approximately power law relationship between the concentration, dZn, and the flow rate, Q, of dZn = k Q^p, where p = 2.5 +/- 0.5. However the wide scatter in the data creates a large uncertainty in the exponent of the power law. Additionally, the scatter indicates that at least one other factor is needed to accurately model the data. Possibly this factor is the temperature of the water, however, this influence appears not to be discussed in the RI analysis. Possibly the temperature of the water was not recorded during the measurement but that seems somewhat unlikely.

When the probabilistic model for concentration is constructed, as shown in Figure 5.5-2, as a function of discharge, a large discrepancy exists at low discharge rates and significant differences between the model and the measured data appear at medium and high discharge rates. Quite likely, the incorporation of the power law relationship into the probabilistic model for concentration is responsible for these discrepancies. The model is a much simplified representation of the processes at play in Canyon Creek. However our objective at this point in the review is not so much the development of more accurate models but rather to assess the effect of these uncertainties on the model's predictions. Interestingly, the discrepancies in the probabilistic model for lead concentrations are even more pronounced than for zinc, but those for cadmium concentration are curiously better. This suggests even more that at least one additional dependency, as yet undiscovered, plays an important role in modeling the concentration. A good bet is that it's the water temperature.

As an example of the effect of functional uncertainty in the CSM, consider what the impact would be on the concentration estimates for the range of uncertainty in the exponent p, of the power law that is used in the CSM's probabilistic models. In the case of the dissolved zinc concentrations in Canyon Creek, as shown in Figure 5 5-6, the range of the exponent p, that reasonably fits the measurements is 2.0 < p < 3.0. The effect of this range of uncertainty on the resultant concentration is Q^2 < dZn < Q^3. To quantify this take a median flow rate, say Q = 100 cu-ft/sec, then the range of uncertainty is 10,000 < dZn < 1,000,000, which is an uncertainty of 100 times! i.e. the high end of the range is 100 times the value of the low end of the range. For comparison, the RI indicates that the uncertainties in lead or zinc concentration for the water at various places in Canyon Creek is something like a factor of only 1.5. A factor of 1 5 is not even close to the factor of 100, that results from the uncertainty in the fitted power law's exponent. For this reason alone there is ample reason to be concerned that the CSM estimates of the metals concentrations in Canyon Creek, as well as the entire CDL basin may be significantly in error.

The modeling for lead concentration, as shown in figure 5 5-11, has such large fluctuations in the measured data as a function of

Response Text

Because this comment questions some fundamental quantitative relationships and results in the RI, it is responded to in some detail. The most important questions relate to Figure 5.5-6, the major focus of the comment. Figure 5.5-6 graphs dissolved zinc (dZn) concentrations versus discharge (Q) for Canyon Creek station CC288 and includes a "best fit" regression line through the data. Because of its central importance in the comment, the response begins with Figure 5 5-6. Responses to comments related to Figure 5.5-11, which is similar to Figure 5.5-6 but for total lead, and Figure 5 5-2 follow Figure 5.5-6.

Figure 5.5-6.

Overall, the statements in the comment related to Figure 5.5-6 are not supported by the data in the figure. In particular, the uncertainty inherent in the data and the relationship shown in the figure is about 1/10 of that stated in the comment, and predicted values are about 120 to 720 times more accurate than stated. The following paragraphs provide elaboration.

Figure 5.5-6 Regression Line. The regression line relationship shown in Figure 5 5-6 is Ln[dZn]=m*Ln{Q}+b. The regression coefficients m and b were estimated from the available data in the usual way, by the method of least squares, to yield m = -0.51 and b = 9.62. These estimates were used to graph the regression line through the data as shown in the figure. (Mathematical details of the regression analysis were not included in the RI but are part of the Administrative Record). Algebraically, the relationship Ln[dZn]=m*Ln{Q}+b, where m = -0.51 and b = 9.62, is exactly equivalent to dZn=15129Q-0.51.

Power Law. The comment says that the data in the figure are represented by a "power law" of the form dZn=kQ^p (note that "p" should be called "m" to be consistent with the figure), and that exponent p = 2.5, or in the range 2.0 < p < 3.0. The comment is silent on how values of p were determined and values of k are not addressed. Nevertheless, the comment states that uncertainties associated with concentration predictions based on this power law are so extreme (varying by factors of 100) as to call into question important results in the RI.

These statements are, however, unfounded because a value of p (or m) equal to 2.5 (or 2.0 < p < 3.0) is inconsistent with both the data and the regression line in Figure 5.5-6. Since the figure shows that concentrations decrease with increasing discharge, the value of p (or m) must be negative. It is therefore obvious from the figure, without mathematical analysis, that any value of p greater than zero (p>0) is inconsistent with

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discharge rate that the power law model should be judged as wholly unsatisfactory. The poorness of fit to the power law model should be taken as a warning that the estimates produced by the probabilistic model for lead concentration, and subsequent lead loading, are not reliable.

the data.

Based on the regression analysis, the value of p (or m) is actually -0.51; i.e., p or m = -0.51. As stated, the regression line Ln[dZn]=m*Ln{Q}+b shown in the figure is exactly equivalent to dZn=15129Q-0.51, where m = -0 51. As can be seen from the figure, this "best fit" regression line does fit the data reasonably well.

So p is not 2.5 but -0.51. Further, the uncertainty in p (or m) is not +/- 0 5, as stated in the comment, but 1/10 of that, namely +/- 0.051 (the standard error of m). Therefore p is not $2.0 < p < 3.0$ but $-0.56 < p < -0.46$.

These results show that the uncertainty inherent in the data and the relationship shown in the figure is about 1/10 of that stated in the comment. The reliability of the relationship in Figure 5.5-6 is therefore about 10 times greater than implied in the comment. Using unsupported values of p in the power law also leads to other errors, as discussed next.

Predicted Concentrations at Q=100 cfs. Using the power law with $2.0 < p < 3.0$, the comment states that for a "median" Q of 100 cfs the range of uncertainty in predicted dZn concentration is 10,000 to 1,000,000 [ug/L], which is a factor of 100.

It is, however, apparent from the figure that no data lie in the range of 10,000 to 1,000,000 ug/L. The total range of dZn concentrations graphed in the figure over all values of Q (not just Q=100 cfs) is from a minimum of 451 ug/L to a maximum of 7,240 ug/L. This concentration range over all Q (11 to 384 cfs) represents a maximum factor of 16. This maximum range over all Q from 11 to 384 cfs is about 1/6 of the range of 100 for a Q of 100 cfs that is stated in the comment. (It is also apparent from the figure that 100 cfs exceeds the median or 50th percentile Q, which is actually 29 cfs; Q=100 cfs corresponds to the 84th percentile Q).

The actual predicted range of dZn concentrations from the relationship graphed in the figure (i.e., dZn=15129Q-0.51) for a single measurement at Q=100 cfs is 928 to 2,200 ug/L (expected value +/- 1 standard deviation), not 10,000 to 1,000,000 ug/L. The range of 928 to 2,200 ug/L corresponds to a factor of 0.81, not 100. The actual factor of 0.81 is 122 times less than the stated factor of 100. For the average of repeated measurements at Q=100 cfs, the predicted range decreases to 1,333 to 1,531 ug/L, a factor of 0.14. The actual factor of 0.14 is 722 times less than the stated factor of 100.

These results show that the predicted dZn concentrations based on the relationship shown in Figure 5.5-6 can be considered approximately 120 to 720 times more accurate than stated in the comment. The comment also questions "model adequacy", as

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discussed next.

Model Adequacy. The comment questions the validity of metal concentration estimates for Canyon Creek, and the entire basin, because of uncertainty and potential error reflected in Figure 5.5-6, calling the adequacy of the model into question. In particular, the comment says that at least one other factor is needed to accurately model the data, and speculates that water temperature is that factor.

Although "accurately modeled" is not quantified, the model (regression line) in Figure 5 5-6 is, as already discussed, approximately 10 times more reliable and predicts concentration ranges 120 to 720 more accurate than the comment states. As is usual in science and engineering, to have a useful model, it is neither practical nor necessary to include all factors that could potentially affect predicted relationships. In particular, including water temperature would be an unnecessary complication unlikely to be of practical value. Figure 5 5-6 reflects the actual relationship, based on available data, between dZn concentrations and discharge at Canyon Creek station 288.

Figure 5.5-11

Figure 5.5-11 is similar to Figure 5 5-6. It graphs total lead (tPb) concentrations versus discharge (Q) for Canyon Creek station CC288 and includes a "best fit" regression line through the data.

The response to comments for Figure 5.5-6 is generally appropriate for Figure 5.5-11, recognizing that specific quantitative estimates would be different. Although the regression relationship for total lead is not as good as the one for dissolved zinc, the comment conclusions that the power law model is wholly unsatisfactory and that estimates for concentration and loading are not reliable are unfounded. Figure 5.5-11 reflects the actual relationship, based on available data, between tPb concentrations and discharge at Canyon Creek station 288.

Figure 5.5-2

The comment is confusing with regard to Figure 5 5-2. The figure is intended to show the adequacy of assuming that discharges Q are lognormally distributed. In particular, the figure graphs the statistical parameter known as the normal standard variate "u" versus the log of discharge Q for Canyon Creek station CC288. Figure 5.5-2 does not relate to concentrations or any "power law" associated with Figure 5.5-6, since Figure 5 5-2 is independent of Figure 5.5-6.

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1898	Draft	1.0	91

Comment Text

Section I - Comment on the General Approach of the Remedial Investigation, (RI)

To set the stage for this comment on the RI's general approach, it is useful to review the stated purpose as that appears in the RI's introductory section in Volume 1, Part 1, on Setting and Methodology. Here is that excerpted statement of purpose.

1 1 PURPOSE OF REPORT
This report summarizes data and analyses on the nature and extent of mining contamination in the basin. Data have been collected and analyses conducted through the RI/FS process of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. 9601 et seq., and the implementing regulations in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR Part 300. The information presented in this RI report will be used to evaluate risks to human health and the environment and potential remedial alternatives.

As can be seen in the statement of Purpose, the process of assessing the degree of mining contamination is critical to the follow-on process that will evaluate the risks to human health and the environment and determine potential remedial alternatives. Hence it is imperative in this comment to carefully review the methods that the RI has used to determine the degree of mining contamination in the CDL Basin in general, and Canyon Creek in particular.

Before proceeding with a discussion of the RI's methods, notice that the Draft RI has the following paragraph in its introductory section. This paragraph is the stated justification for the EPA to expand the geographical area for the RI/FS.

In the view of EPA and the United States, the geographic area evaluated in this RI/FS is included in the Bunker Hill Mining and Metallurgical complex facility that was added to the National Priorities List (NPL) in 1983. In September 1998, a federal district court judge ruled that this NPL facility was limited to the 21-square-mile area known as the Bunker Hill Superfund Site (U.S. v. ASARCO Inc , 28 F.Supp.2d 1170). This ruling was vacated on appeal by the Ninth Circuit Court of Appeals 214 F.3d 1104. This leaves standing the view of EPA and the United States.

The last sentence in the above paragraph should be understood as the EPA's interpretation of the Ninth Circuit Court of Appeals ruling. The above excerpt is not an exact quote of the ruling. For a complete text of the decision see, for example,

http://laws.findlaw.com/9th/9836247.html

A careful reading of the ruling itself reveals that the Ninth Circuit Court of Appeals judge reported that the Court had no jurisdiction in the case and consequently vacated with a stay the District Court's decision. The 'stay' is an important element of the ruling as it is intended to stay the continuation of the District Court trial pending an appeals by the plaintiff in the US Court of Appeals, an appeal which as yet to be initiated. An interpretation of the Ninth Circuit Court Ruling that takes the stay into account is that no resolution of the U.S. v. ASARCO suit has yet been reached. In particular the ability of the EPA to take the initiative in any geographic expansion of the RI/FS has not been decided. Evidently the ambiguity of the ruling was recognized by the RI authors and an additional paragraph was added in the RI Volume 1, Part 7, Summary, that explains the RI/FS can indeed be conducted independently of the expanded geography's inclusion in the National Priorities List.

Response Text

Comment noted. See response to Comment #1899.

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The geographic area evaluated in the Coeur d'Alene Basin RI/FS is included in the Bunker Hill Mining and Metallurgical complex facility that was added to the National Priorities List (NPL) in 1983. In September 1998, a federal district court judge ruled that this NPL facility was limited to the 21-square-mile area known as the Bunker Hill Superfund site. U.S. v. ASARCO Inc., 28 F.Supp.2d 1170. However, this ruling was vacated on appeal in the Ninth Circuit Court of Appeals, leaving EPA's view of the NPL facility standing. Inclusion on the NPL is not a precondition for the conduct of an RI/FS, pursuant to Section 104(b)(1) of CERCLA, 42 U.S.C. 1 9604(b)(1). See also NCP 40 CFR Part 300.425(b)(1).

Certainly then, with the intention to address the risks to human health and threat to CDL basin ecology, the EPA has entered into partnerships with particularly the CDL Tribe, the State of Idaho, the State of Washington, as stated in the following paragraph from Volume 1, Part 1.

After completion of the BHSS RODs, information from a variety of sources indicated broader threats from mining contamination in the basin than were previously understood. These threats include risks to human health within residential communities and recreational areas outside the BHSS. These threats also include impacts on ecological receptors outside the BHSS, such as fish and waterfowl. To evaluate these threats in a comprehensive manner, EPA began this RI/FS for the Coeur d'Alene River basin in early 1998. EPA has contracted with URS Greiner, Inc., and CH2M HILL to conduct this RI/FS, in partnership with the Coeur d'Alene Tribe, State of Idaho, State of Washington, and other federal, state, tribal, and local agencies.

1899	Draft	2.0	**92**

Comment Text

I. The Conceptual Site Model - methodology and reliability

At this point my review will consider the method of analysis used in the RI called the 'Conceptual Site Model', or the CSM. A paragraph has been excerpted from the RI, which offers its own definition of the CSM. This is from Volume 1, of the RI, Part 1.

2.0 CONCEPTUAL SITE MODEL SUMMARY
2 1 INTRODUCTION
A conceptual site model (CSM) is often used to convey a summary of the sources of contamination, mechanisms of contaminant release, pathways of contaminant release and transport, and the ways in which humans and ecological resources are exposed to contaminants. These were the general purposes for the development of a CSM for the Coeur d'Alene basin Remedial Investigation/Feasibility Study (RI/FS). However, for this large and complex site, the CSM also provides a basis for assembling information about the basin and data from diverse sources into a structure that allows systematic analysis of specific sources of contamination at an adequate level of detail, while maintaining an understanding of the overall context of the effects of all of the important sources of contamination. The underlying structure of the CSM is also used in this report as a way of organizing and presenting site information. This will facilitate the analysis of potential remedial actions and alternatives at appropriate spatial scales. The detailed CSM is published under separate cover (CH2M HILL 2000). This section is a summary of that document.

The essence of the definition of the CSM is that a model is developed that represents, and in some cases predicts, key features of a large and complex site that contains interlocking relationships between geological, ecological and human factors. In the CSM a great many interrelated variables are distilled down to a few hopefully simple dependencies. These dependencies are related functionally in a (hopefully) analytical relationship that is intended to represent the behavior of the original large complex entity.

Response Text

Due to the large geographic area of the basin, it was not practical to collect data to fully characterize each source area or watershed. The use of a Conceptual Site Model helps focus efforts by identifying sources and fate and transport mechanisms common across the Basin.

EPA has made reasonable use of a number of existing sources of information, reducing the costs of otherwise duplicate efforts.

At the beginning of this RI/FS, EPA conducted many meetings with stakeholders in the Basin in order to incorporate concerns from interested parties. This process is summarized in Part 1, Section 5. The formulation of the CSM resulted from this process.

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As in most cases where great complexity is vastly simplified, the result is an approximation of the original. In some cases the approximation is very good and the analysis is said to be faithful. Typically, the approximation is good only within narrow ranges of the dependent variables. This case we'll call "limited fidelity". An important aspect of limited fidelity is that it typically doesn't know when it's not faithful, which is like being tone deaf.

The CSM is a good example of a tone deaf model with limited fidelity. Thus when for example in the RI the CSM is presented as a faithful representation, as in this excerpt from Volume 1, Part 1, Section 2,

A hierarchical approach was used for the CSM. In this approach, concepts of physical relationships of sources of mining waste and the lands and waters of the basin, chemical and physical processes causing releases, fate and transport of mining wastes, and affected resources are presented as a series of diagrams, tables, and text. The diagrams represent the general relationships between entities (e.g., waste sources) and processes (e.g., transport mechanisms) and are composed of expandable "nested" elements that are themselves expanded in additional diagrams, tables, or text if needed to illustrate or understand greater detail than can readily be shown on a single diagram. To facilitate analysis of processes at work in the basin, parts of the basin with similar geomorphology, stream gradients, and amounts and types of mining wastes were grouped into CSM units (Figure 2.1-1).

care should be taken in accepting the validity of the results. Here again, from the same section as above, the CSM is presented as a credible, trustworthy model.

The CSM units have a fairly large geographic scale, but are sufficiently homogeneous that types of waste sources, mechanisms of release and transport of waste, and the natural resources affected by the release of wastes are similar in each CSM unit. The CSM units were numbered from upstream to downstream (one through five). Each of the CSM units was further divided into smaller components. For CSM Unit 1, which comprises most of the larger, upper tributaries in the Coeur d'Alene basin, individual watersheds (e.g., Canyon Creek, Ninemile Creek) were selected as an intermediate subdivision because risk assessments and ongoing and future remedial actions could be conducted at a watershed scale.

In order for any model of this nature to be trustworthy an estimate is needed of the model's susceptibilities to uncertainties in assumptions of analytic dependency as well as uncertainties in input quantities. This estimate is typically called an error analysis. In the RI, some attention was indeed paid to error analysis, as for example discussed in Volume 1, Part 1, Section 2.

While discussing future ecological goals during workshop sessions, it became apparent that non-mining-related actions impose limitations on the ecological potential of some mining-waste-affected areas. While discussing the potential target ecological conditions shown in the CSM, an attempt was made to account for the limitations to the potential for recovery of natural resources caused by non-mining-related factors and actions. The mining and non-mining factors and actions are called disturbances as noted on Figure 2.1-2, which shows how the disturbances cause stresses that act through effects pathways and can adversely affect the same ecological resources that are also affected by releases of mining waste. Figure 2.1-2 is a generalized representation of the entire Coeur d'Alene basin, with some disturbances being more important in some parts of the basin than in others. Draft lists of ecological receptors shown in the CSM can be found in CH2M HILL 2000; they have been refined and replaced with a single table in the Ecological Risk Assessment (Eco RA under separate cover).

The application of the CSM to Canyon Creek is a process of identifying contaminants and then modeling their distribution and

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transport into and then through the watershed. The RI describes the features of this initial approach to the construction of a CSM.

CSM Unit 1 contains a large number of the mine and mill sites that are the primary sources of mining waste in the Coeur d'Alene basin. It is also the location of continuing releases of metals from mining waste to the Coeur d'Alene River system. The following sections briefly describe an understanding of each of the watersheds in CSM Unit 1 that are listed in the CSM (Table 2.1-1). Individual important sources of metals are described in the Nature and Extent of Contamination section for each watershed.

In particular, the application of the CSM analysis to Canyon Creek is discussed in the RI, identifying many sources of dissolved metals and quantifying the amount of particular metals such as lead and zinc. The CSM in this case is a model that estimates the metals concentration, and loading, in Canyon Creek as a function of dependent quantities such as flow rate. The details of this models afford the opportunity to estimate the effect of uncertainties in the models' assumptions as well as uncertainties in the input quantities. My objective is then to find the extent that the RI performs this uncertainty estimate and to attempt such an estimate independently for purposes of comparison. Before undertaking the comparison, here to set the stage is the RI's description of the metals problem in Canyon Creek.

2 2.3 Canyon Creek
Canyon Creek, which has been impacted by mining activities and past and continuing releases of mining wastes, is divided into five segments. Segment 1, Upper Canyon Creek above the Hecla water intake, has some potential source areas (Appendix I), but does not appear to receive much metals input currently based on sampling in Segment 1 and the upper part of Segment 2. Segment 2 of Canyon Creek, from the Hecla water intake to the mouth of Gorge Gulch, has more potential sources in proximity to the creek, has relatively low concentrations of metals in surface water, and does not contribute significantly to metals loading to the Coeur d'Alene River system. Segment 3 of Canyon Creek, Gorge Gulch, has a number of potential source areas (Appendix I) including the Hercules complex and others. Sampling of surface water at the mouth of Gorge Gulch indicates dissolved metals above the national ambient water quality criteria. It is possible, but not demonstrated, that additional metals loading enters Canyon Creek from Gorge Gulch as groundwater flow.

Segment 4 of Canyon Creek contains a large number of potential source areas (Appendix I). Concentrations of dissolved metals in surface water are well in excess (sometimes greater than 100-fold) of ambient water quality criteria, and about 100 to 300 pounds per day of zinc enter Canyon Creek in segment 4. Aquatic life is nearly absent from segment 4 of Canyon Creek. Most of the stream bed in segment 4 is in bedrock, but some interaction with contaminated groundwater is likely.

Segment 5 of Canyon Creek is the lower part of the watershed near Woodland Park. The valley broadens into a depositional basin in segment 5, with up to 40 feet or more of alluvium above the underlying bedrock in places, but narrow above the confluence with the South Fork of the Coeur d'Alene River. A former tailings dam at Woodland Park enhanced the deposition of tailings until the dam failed due to floods in 1917. The number of potential source areas in Segment 5 are fewer than in Segment 4 (Appendix I), but Segment 5 contains the Hecla-Star tailings ponds, which are, in aggregate, a very large feature. Concentrations of dissolved metals exceed the ambient water quality criteria by up to ten-fold, or more, and aquatic life is nearly absent from Segment 5. Loading of dissolved zinc to Canyon Creek increases by about 200 to 400 pounds per day, depending on season. Significant interactions between surface water and groundwater occur in Segment 5 of Canyon Creek. In the upper part of Segment 5, surface water is lost to groundwater. The groundwater reenters the creek in the lower part of Segment 5, substantially enriched in dissolved metals. It is believed that groundwater interacts with floodplain tailings deposits under the Hecla-Star tailings ponds, and is augmented by mine

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drainage water discharged to the ponds.

Tailings deposits from the floodplain in Segment 5 of Canyon Creek have been excavated and placed in a new repository on the south side of the valley. The stream has been reconstructed with designed habitat features to favor the return of fish if metals concentrations become sufficiently reduced. Attempts to re-vegetate the floodplain have met with limited success, with grasses being the only plants surviving to any extent. Sampling for this RI suggests that some floodplain soils remain contaminated with metals. It is not known yet what the effects of tailings removal will be on loading or concentrations of metals in lower Canyon Creek. Monitoring of groundwater in the floodplain suggests that a plume of metals has formed in association with the new tailings repository.

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Comment Text

II. Background Metals Concentrations - estimation methodology

The concentration of metals in the "background" is a concern that has received a great deal of attention in the RI as well as in previous remedial investigations. Even so, a determination of the metals background in the CDL basin that is satisfactory to a broad class of interests still seems to be an elusive goal. Because the background levels play such a significant role in the classification and remuneration of contaminated environments, the process of estimating background concentrations should be one of the highest priority efforts of the Remedial Investigation. This prioritization is reflected in the RI itself, as for example in the section devoted to the discussion of background metals concentration in Volume 1, Part 7.

3.2.1 Determination of Background Metals Concentrations
A primary purpose of the RI was to identify areas within the Coeur d'Alene River basin that are contaminated by mining wastes. Contaminated areas can be determined by comparing concentrations of metals in environmental media (soil, sediment, and water) with concentrations that are likely to be naturally occurring. Those naturally occurring concentrations (not influenced by mining contamination) are called "background concentrations." Once established, background concentrations can also be used to assist in the selection of remedial goals or target clean-up levels when used in conjunction with risk-based values determined through human health and ecological risk assessments.

The background concentrations for groundwater was particularly difficult to determine. Evidently, no bottles of water taken from wells dug before the mining era can be found.

Sufficient data were available for soil and surface water to develop background concentrations. Sufficient data were not available to develop background concentrations for groundwater. To determine which portions of the Coeur d'Alene River basin should be considered contaminated and, therefore, evaluated in the feasibility study, concentrations of metals in environmental media were compared with background values and risk-based benchmarks. Background concentrations derived for use in the remedial investigation are discussed in Part 1, Section 5.2.

The definition of background concentrations is presented in the RI as,

5.2 DETERMINATION OF BACKGROUND CONCENTRATIONS
A primary purpose of the RI is to identify areas within the Coeur d'Alene basin that are contaminated by mining wastes. Areas that

Response Text

The background section has been significantly revised to include background ranges for the upper CDAR Basin, lower CDAR Basin, and the Spokane River Basin. Text and tables in this section have all been replaced. Methods and data used to evaluate background concentrations are presented in a Technical Memorandum that is included in the Administrative Record.

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are contaminated can be determined by comparing concentrations of metals in the environmental media (soil, sediment, and water) with concentrations that are likely to be naturally occurring. Those naturally occurring concentrations, which are not influenced by mining contamination, are called background concentrations. Background concentrations can also be used to assist in the selection of remedial goals or target clean-up levels when used in comparison with risk-based values determined through risk assessments.

Notice that the RI did not perform any sampling in the CDL basin, but relied on previous sampling efforts to provide the necessary data to characterize the metals background. Here, again as taken from Volume 1, Part 1:

The Coeur d'Alene basin is highly mineralized, so estimates of background concentrations of metals in soil, sediment, and water that are based on national or global concentrations of metals may not be appropriate for use there. Because of extensive previous investigation of the Coeur d'Alene basin sampling for the explicit purpose of determining background levels for metals in soil, sediment, and water was not done as part of the RI/FS investigation. For the purpose of determining which portions of the Coeur d'Alene River basin should be considered contaminated and therefore evaluated in the RI/FS, concentrations of metals in environmental media (soil, sediment, and water) can be compared with naturally occurring background values, as well as risk-based benchmarks.

The conservative policy for estimating background as stated in this following paragraph in Volume 1, Part 7, is important considering the uncertainties in establishing the pre-mining era background. However, I would have preferred the policy in the RI to be stated in a somewhat modified form as: "...upper reference values were DETERMINED from the higher part of the ranges of the ESTIMATED background concentrations". Except for the Bob Hopper measurements at the Cataldo Mission, very little sample material exists from the period prior to the development of the mining industry in the CDL basin.

To minimize the likelihood of incorrectly identifying an area as contaminated by mining waste, upper reference values were estimated from the higher part of the ranges of background concentrations. The data sources used are identified in the respective sections. Supporting evidence for the values selected is offered based on sampling done for the Basinwide RI/FS (this study) and for the Bunker Hill RI/FS. (from Volume 1, Part 1)

The reason for the RI's decision to use existing measurements of background concentrations is indicated in this following section. The relationship between soil and sediment can reasonably be used to assess the historic soil concentrations from existing sediment concentrations if analyzed appropriately.

5 2.1 Soil and Sediment
The ultimate source of sediment in the Coeur d'Alene basin is the native soil and rock in the basin. It is recognized that the processes of weathering, transport, dissolution, chemical precipitation, and interactions with organic matter can alter the form and concentration of metal in sediment relative to those in upland soil and rock, but the general bulk metal content of sediment in the Coeur d'Alene basin is similar to that of the soil it is derived from (LeJeune and Cacela, 1999), especially when compared to concentrations in mining-contaminated sediment. For that reason the background and upper background concentrations discussed in this section are assumed to apply to both soil and sediment. (from Volume 1, Part 1)

The data base for this analysis is the Gott and Cathrall (1980) study which involved a large number of measurement of metals concentration at a large number of locations in the CDL basin.

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The principal source of data on concentrations of metals in soil and rocks in the Coeur d'Alene basin is the geological study by Gott and Cathrall (1980). Gott and Cathrall sampled soil at approximately 8,700 locations and rocks at about 4,000 locations. Samples were collected opportunistically throughout the basin for the purpose of examining the possibilities of using information on the metals content of near-surface soil and rock to determine the location of economic deposits of minerals. Near-surface, rather than surface, samples were collected to avoid potential bias of their results by metals deposited throughout the region by past emissions from the lead smelter at Smelterville, but some samples were affected by mining.

Because the study by Gott and Cathrall used opportunistic sampling, the surface area represented by each sample varies. To reduce the statistical effects of this non-random sampling, LeJeune and Cacela (1999) spatially averaged the concentrations into aggregated 0.5-km2 hexagonal cells, and then calculated a mean value for each cell. This resulted in 1,005 cell means. LeJeune and Cacela added data from other sources including the basinwide RI and studies by the U.S. Geological Survey and then calculated statistics on concentrations of cadmium, lead, and zinc in various reference areas (which included mineralized zones), in soils and rocks over mineral stocks, and in soil and rocks over mineral stocks. (from Volume 1, Part 1)

The large number of measurements of metals concentration lend themselves to a classical statistical analysis where such concepts as statistical sampling, independence, distribution function, mean, standard deviation, correlation scales and probability distribution can be tested, estimated and produced. From the above excerpt, the only statistical consideration given to these measurements was the desire to ameliorate the non-random sampling by averaging over a 0.5-km2 grid. However, from first statistical principles and on the most fundamental of ground, samples from an opportunistic sampling process cannot be transformed into samples of a probabilistic distribution. The opportunistic incentives disturb irrecoverably the essence and the opportunity for probabilistic measure.

However, it does seem a shame not to be able to use all this data. It would in fact be interesting to treat the samples as if they were not taken opportunistically or of the opportunity for sampling were independent of the sample's content, i e. you stubbed your foot on a rock and picked it up. Then we could proceed with a statistical analysis to see what that might reveal. Although a probabilistic interpretation of the results is formally excluded, significant insight into the background concentrations of metals in the CDL basin may indeed be obtainable. Some consideration of the statistics of the measurements was made, as discussed in the following excerpt.

Gott and Cathrall (1980) determined anomalous "threshold" concentrations for eight of the chemicals of potential concern (COPC) in soil and rocks, and determined the 90th percentile of the metals concentrations in soil and rocks for nine of the COPC. Threshold values were estimated from upward inflections in the slopes of cumulative distribution plots of log-metals concentrations versus sample rank. Ordinarily, these anomalous values would be a good indication of levels representing contamination. However, in a heavily mineralized area, threshold values represent the break between non-mineralized and mineralized samples. Contaminated or highly mineralized levels are better represented by the 90th percentile of the background data (Quiring 1999). These values were used for screening levels for the human health risk assessment to avoid identifying elevated "natural" concentrations as contaminated. The soil threshold values of Gott and Cathrall (1980) were sometimes lower and sometimes higher than the 90th percentiles of their data (Table 5.2-1). Gott and Cathrall did not determine threshold values for iron and manganese. Their cumulative distribution plot of manganese did not have an upward inflection, suggesting that the distribution of manganese was not influenced by mineralized areas. They did not plot concentrations or suggest threshold values for iron. Several of the statistics for

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soil calculated by LeJeune and Cacela (1999) for cadmium, lead, and zinc are also shown in Table 5 2-1, including geometric mean concentrations in their pooled reference areas, the 95th percentile of the data from their pooled reference areas, and the 95th percentile of the data for soils over stocks and mineral belts. (from Volume 1, Part 1)

The prescription to use the "upward inflections in the slopes of cumulative distribution plots of log-metals concentrations versus sample rank", is common to the assumption that the sample distribution is Gaussian in nature. However, from the above discussion, e.g., "The soil threshold values of Gott and Cathrall (1980) were sometimes lower and sometimes higher than the 90th percentiles of their data", it there is a strong indication that the distribution is not Gaussian. The non-Gaussian nature of the distribution likely is the result of the mixture of two or more distribution, as recognized in the RI:

Runnels (1999) proposed that the calculations of LeJeune and Cacela (1999) would underestimate background values because they failed to consider the contribution from surface expressions of ore veins and associated highly mineralized areas. Maest et al. (2000), taking into account the suggestion of Runnels, recalculated the statistics of LeJeune and Cacela (1999), and found that the geometric mean concentrations would be increased less than two percent by taking these highly mineralized areas into account. This was mainly because the surface expressions of the ore veins and their surrounding mineralized rocks are a very small fraction (0.4 percent in Canyon Creek, and 0.2 percent in the entire upper South Fork) of the total surface area contributing soil and sediment to the basin, and because mineralized rocks were already included to some extent in the LeJeune and Cacela (1999) calculations. (from Volume 1, Part 1)

The complexity of the background concentration estimation process is further indicated by this continuing discussion in the RI.

For screening purposes, we are using the higher of either the 90th percentile of Gott and Cathrall (1980) or the 95th percentile of the pooled reference values for cadmium, lead, and zinc from LeJeune and Cacela (1999). The Gott and Cathrall 90th percentiles may be biased high because (1) the samples were collected as part of an economic mineralization survey, and (2) some of the samples may have been collected in proximity to mining waste. The 95th percentiles for cadmium, lead, and zinc of the pooled reference areas of Le June and Cacela are similar to the 90th percentiles of Gott and Cathrall. As noted above, the changes in mean values caused by more detailed consideration of the ore veins by Maest, et al. (2000) were small (0.2 to 0.4 percent). The respective 90th and 95th percentiles are values that may be attributed to natural conditions in limited parts of the basin that are highly mineralized. The extent of mineralization varies across the basin (Gott and Cathrall, 1980; LeJeune and Cacela, 1999). Therefore it is possible that background concentrations of metals in soil would also vary. For screening purposes, we selected background concentrations from the upper part of the likely distribution. Evidence that the values selected are representative of at least highly mineralized portions of the basin is available from data collected for this RI and for the Bunker Hill RI. (from Volume 1, Part 1)

The suspected presence of two or more statistical distributions in the metals concentration measurements is in fact suggested in the continuing discussion.

The Woodland Park area of lower Canyon Creek is a depositional area that receives alluvium carried down Canyon Creek. A number of surface and subsurface samples of soil were collected from the Woodland Park basin during the installation of boreholes for this RI. Figures 5.2-1 through 5 2-8 show the cumulative distribution plots for arsenic, cadmium, copper, iron, lead, manganese, mercury, and zinc, respectively. Lines on the plots are fitted by eye. Draft plots for antimony and silver appeared to show two statistical populations, but many of the reported... (from Volume 1, Part 1)

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Evidence for yet additional complexity in the statistical distributions of metals concentration is seen in the cumulative plots for lead concentration. Here is the discussion for lead.

The cumulative distribution plot of lead concentrations (Figure 5.2-5) had a distinct discontinuity (abrupt change in concentrations) and a change in slope between a subsurface sample with 149 mg/kg and another subsurface sample with 925 mg/kg of lead. The distribution of lead does not fit a single log-normal population according to the results of the Shapiro-Wilk test. There is another change in slope at about 7,000 mg/kg, and yet another at about 10,000 mg/kg. No surface samples fell on the lower line, but four subsurface samples fell on the upper line. Examination of the boring logs (Appendix B) for the subsurface samples indicated that the four that fell on the upper line were all the uppermost subsurface sample collected at the respective locations, and all were in apparent fill or mining waste. (from Volume 1, Part 1)

The statement: "The distribution of lead does not fit a single log-normal population...", is again a strong suggestion that the mean and standard deviation of the distribution of the lead measurements are not able to be determined "by eye" from the cumulative distribution, and may not be meaningful in the sense of estimating probability of occurrence or likelihood.

The situation for some of the other metals like manganese is in better shape.

The cumulative distribution plot of manganese concentrations (Figure 5.2-6) appears to have a change in slope at about 30 mg/kg, but the results of the Shapiro-Wilk test indicate that the manganese values approach a log-normal distribution. (from Volume 1, Part 1)

But mercury experiences the same problem as lead.

The cumulative distribution plot of mercury concentrations (Figure 5.2-7) had a distinct population of uncertain, but all less than 0.08 mg/kg (below detection limit) samples which are not shown on the plot, a group of samples between 0.11 and 1 3 mg/kg, and a group of samples above a change in slope at 1 3 mg/kg. (from Volume 1, Part 1)

And zinc although possessing some anomalous character look like it may indeed be a log-normal distribution.

The cumulative distribution plot of zinc concentrations (Figure 5.2-8) has a slight break at about 1,150 mg/kg, but approaches a log-normal distribution according to the results of the Shapiro-Wilk test. (from Volume 1, Part 1)

The situation specific to Canyon Creek does not differ from the general case. The nature of the statistical distributions is anomalous with respect to a log-normal distribution and subsequent interpretation of simple estimates of mean and standard deviation are likely to not be meaningful. For example,

The distinct discontinuity in the cumulative distribution of lead in soil in the Woodland Park depositional basin was used to identify which samples could be considered background. Concentrations of the other metals in the samples where lead was taken to be background were also evaluated as background, with the strong reservations discussed below regarding movement of other metals in groundwater. The estimated background ranges for the Canyon Creek watershed are shown in Table 5.2-2. The estimated

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background range for lead is 7.5 to 149 mg/kg; less than the 90th percentile of Gott and Cathrall (1980) and the 95th percentile of the pooled reference areas of LeJeune and Cacela (1999). (from Volume 1, Part 1)

The claim in the RI, shown in the following excerpt, that anomalies in the distributions are likely due to mining waste intrusions is a reasonable but untested conclusion. Again, a full statistical analysis is recommended with the objective of identifying mixtures of distributions, separation into independent sets and the establishment of credible probability estimates.

Also shown in Table 5 2-2 are the changes in slope, estimated inflection points, or discontinuity values from the cumulative distribution plots (Figures 5.2-1 through 5.2-8), irrespective of whether the distributions were or were not log-normal. These are analogous to the anomalies of Gott and Cathrall (1980), but in the depositional environment at Woodland Park, samples falling above the anomaly points, except those possibly influenced by movement of metals in solution (below), are likely to be contaminated by mining wastes. The anomalous values for cadmium, copper, manganese and mercury are slightly higher than the respective values of the estimated Canyon Creek background ranges (Table 5 2-2). The anomalous values for arsenic, iron, and zinc were consistent with the ranges found by classifying the samples according to the cumulative distribution plot of lead.

The difficulty of estimating background metals concentration that were encountered for sediment and soils is even further exacerbated for surface water by the problem of finding suitable sites for measurement that are not contaminated by mining activity. The RI even so indicates.

5.2.2 Surface Water
Background concentrations of metals in surface water in the Coeur d'Alene basin were calculated using the approach described in Appendix C of Maest, et al. (1999). The limited information on groundwater that is available for the basin does not allow a general estimate of background. The available information for surface water background will be discussed for specific locations in the upper Coeur d'Alene basin. (from Volume 1, Part 1)

Presumably, concentrations in ground water taken from streams located above areas of significant mining activity would be useful for estimating background concentrations. However, there are very few locations where creeks and streams do not flow through an area of historic mining activity. Some areas where mining exploration occurred may be quite free of contamination in those cases where no production occurred and the tailing deposits show background concentrations. The RI indicates that this is indeed the case:

All median values for background surface water were less than the national chronic criteria. The 95th percentile of the background dissolved lead concentrations exceeded the national chronic criteria calculated at a hardness of 30 mg/L as Ca CO3 in the following areas: the Upper South Fork of the Coeur d'Alene River, the Page-Galena mineral belt area, and in the South Fork basin as a whole ("entire South Fork"). The 75th percentile of the data exceeded the national chronic criteria in the Page-Galena mineral belt area (Table 5.2-10). These results imply that the national criteria would only be exceeded in a very limited number of mineralized locations in the stated drainages at some times. All of the calculated values for zinc and cadmium, including the 95th percentile, were less than the national criteria. (from Volume 1, Part 1)

In summary for the CSM review, there is a great concern that the methodology used to construct the CSM's and their related probabilistic models do not represent the fate and transport of metal contaminants with sufficient accuracy to allow their use as an

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effective means of identify contaminated sites. Further the models lack sufficient sensitivity analysis to permit the estimation of a reasonable margin of error when predicting the degree of contamination.

In summary for the background estimation review, lacking a formal probabilistic sampling and without a more thorough and traditionally "classical" statistical analysis of the measurements in the metals concentration data base, the estimates of background concentration obtained using the analysis as discussed in the RI, and subsequently used in the RI as the basis of determining the background metals concentration are very likely to be inaccurate and misleading. This situation appears to be particularly true for the lead concentrations.

To reiterate, the situation specific to Canyon Creek does not differ from the general cases discussed in this review. The nature of the statistical distributions for metals concentrations is anomalous with respect to a log-normal distribution and subsequent interpretation of simple estimates of mean and standard deviation are likely to not be meaningful. Combined with significant uncertainties in the basis for background concentration estimation, the use of CSM probabilistic models in identifying contaminated sites on or along Canyon Creek is inherently unreliable.

Many of the concerns addressed in this review could be alleviated with attention to the analytical methods tools and procedures. Should the EPA proceed with a design study for remuneration in the CDL basin I strongly recommend that such attention be devoted to analytical modifications. In addition, I would recommend an external review of the design strategy with special emphasis on analytical methodology.

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Coeur d'Alene Lake

5-CSM Unit 4, Coeur d'Alene Lake

1674 Draft — 1.2 — **613**

Comment Text

The CSM Unit 4 section does not appear to include a detailed discussion of ambient water quality criteria or sediment quality mandates or goals that apply to the lake. At a minimum the reader should be referred to specific discussions in other portions of the RI or other reports that define these criteria or goals.

Response Text

Ambient Water Quality Criteria applicable to the Lake are presented in Part 1, Section 5. Additionally, the Lake Management Plan (separate document) has been developed to address potential impacts on the Lake from nutrient loading.

1675 Draft — 3.1 — **614**

Comment Text

3 1 GEOMORPHIC SETTING:
3rd paragraph: Lake CdA summer elevation is 2128.

Response Text

That is correct.

1676 Draft — 4.1 — **615**

Comment Text

4 1 NATURE AND EXTENT:
A more informative and specific discussion that defines the screening levels should be provided and the reader should be referred to specific locations in the RI where the levels are developed. The application of the proposed basin-wide screening levels is inappropriate for Lake CdA where background is far lower than in other portions of the basin above the lake. Horowitz et al demonstrated this.

Response Text

Background concentrations have been developed for the upper basin, lower basin, and the Spokane basin. Screening levels have been revised to reflect these differences in the basin.

1677 Draft — 4.1.1 — **616**

Comment Text

4 1.1 through 4.1 3 segments 01 – 03:
The comparison of sediment and surface water results to screening levels or criteria in the discussion should include a detailed description of 1X, not just 10X. Also, the federal water quality standards should not be demoted to the title of "screening levels".

Response Text

The RI is considered a data report. To limit the size of the RI, a detailed discussion of all 18,000 sample results is not possible. See section 5 on Fate and Transport for discussion and Attachment 2 for a list of sample results and exceedences of screening levels. For simplicity, the screening level selection process is detailed in Part 1, Section 5. The basis of the screening levels are also included as Attachment 4 to each watershed report.

1678 Draft — 5.1 — **617**

Comment Text

5 1 RETENTION OF METALS AND NUTRIENTS:
A recognition and estimation of other inflow sources such as water treatment plants and storm-water sources near population centers should be added to the discussion.

This discussion deserves a far more detailed evaluation, explanation, and discussion of margins of error in the estimation of inflow, outflow, and residual load calculations. Flow rate measurements alone will have errors of at least 5 to 10 %. Error propagation needs to be accounted for in the calculated residuals.

Response Text

Such sources were evaluated in relation to magnitude of metal loads from the CDA River and were found to be very small. In that they were not even sampled, it was decided to not use them in the discussions.

1679 Draft — 5.1.3.1 — **618**

Comment Text

5 1.3.1 Annual Loads:
Independent of the annual loads an exclusive evaluation of the low flow periods of the year (e.g , late summer) is requested to assess loading during base flow periods. Discussion of concentration variation relative to season also is requested.

Response Text

Discussion was added to address temporal variations during the 1999 water year.

No. Detection limits were not an issue.

Coeur d' Alene Basin - Remedial Investigation
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John Roland

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Coeur d'Alene Lake

5-CSM Unit 4, Coeur d'Alene Lake

Did analytical detection limit problems occur with phosphorous, as they did with nitrogen?

1680 Draft | 5.2.1 | **619**

Comment Text

5.2 LAKE HYDRODYNAMICS
5 2.1 Hydrologic Budget, 2nd paragraph:
Where is the error analysis? How was an "Overall error of about 12 percent of total flow" calculated? Is not the residual calculated as inflow minus outflow, rather than outflows minus inflows? How is it that the "budgets were considered accurate" because the residual was simply "less" than the "overall error"? Is "accurate" an appropriate term here? Further discussion and justification for these conclusions are needed.

Response Text

An evaluation of error was added to discussions in hydrologic and constituent budgets. Much of such discussion was based on results of 1991-92 lake study which included a formalized error analysis. The literature used in that error analysis was added to the RI document.

1681 Draft | 5.2.2 | **620**

Comment Text

5.2.2 Hydraulic-Residence Time:
When discussing turbulence and particulate materials transport is the assumption that the particles are carried in or are the particulates derived from the lake? Or, is the intent more a matter of more mass in results in more mass out?

Do the data show a greater relative hydraulic residence time in big water years (or seasons) vs. similar seasons in a lower flow year? The inclusion of flow volumes for comparison would be helpful.

The residence time discussion assumes a fixed lake volume based on summer pool elevation, which in reality is very different in the fall and winter. This difference may influence the outcomes.

The final paragraph of this subsection does not seem to reach any conclusions in relation to actual contaminant fate and transport.

Response Text

Text was revised to more clearly state the several fates that a particle could be subjected to within the lake after it was delivered by inflow.

1682 Draft | 5.2.3 | **621**

Comment Text

5 2.3 Inflow-Plume Routing Within the Lake:
4th paragraph - Please include the dates of sample collection for the range of suspended-sediment concentrations given for the nine samples collected in 1999 (i e., 1.5 to 56 mg/L).

Response Text

Such information was added as requested.

1683 Draft | 5.3.1 | **622**

Comment Text

5 3 SEDIMENTATION
5 3.1 Sedimentation Rates:
1st paragraph - Should the reader infer that the metal and nutrient loading during summer and fall is or is not dominated by particulates?

Response Text

The paragraph's intent was to present the range of possible fates for loadings. Other revisions to the text were designed to quantify the fate of such particles.

1684 Draft | 5.3.2 | **623**

Comment Text

5.3.2 Metals, end of last paragraph:
The sentences discussing "background masses" and "enriched" masses should provide an explanation of the assumptions that went into the calculations. Also, are lead and other metals determined on a wt. basis?

Response Text

The requested assumptions were fairly detailed and were deemed too detailed for this section. The source of the values and their calculations was cited (Horowitz) so the interested reader could get additional detail. And yes, the values were reported on a weight basis, mg/kg.

Coeur d' Alene Basin - Remedial Investigation
Draft
Comments by Commenter
John Roland

Comment No.	Version	Subsection / Add'l Ref	Doc ID	
Coeur d'Alene Lake				
5-CSM Unit 4, Coeur d'Alene Lake				
1685	Draft	5.3.3	**624**	
Comment Text				**Response Text**
5 3.3 Nutrients: Statements should be added to this discussion that address the influences of human development relative to nutrient conditions.				Such information was introduced in the discussions of lake water quality, i.e., eutrophication potential. Also, detailed descriptions of this topic are contained in the USGS lake report for 1991-92.
1686	Draft	5.4	**625**	
Comment Text				**Response Text**
5.4 GEOCHEMISTRY OF LAKEBED SEDIMENTS, end of last paragraph: The discussion states that dissolved metals in the hypolimnion were between 1 5 and 3 times higher than those in the upper water column. Does this apply to all year, or just in the summer?				The statement refers only to summer (early June-mid-October) of the 1999 water year. Additional discussion of such gradients are contained in section 5.7.6 and cover 1991-92, 1995-98, and 1999.
1687	Draft	5.5.2.1	**626**	
Comment Text				**Response Text**
5 5 LAKEBED FLUXES OF METALS AND NUTRIENTS 5 5.2 .1 Dissolved metals and Sulfate: 2nd paragraph - A more informative and conclusive summary is desired for this benthic flux discussion.				Discussions were revised to better inform the reader of the relation between riverine and benthic flux effects on the lake's water quality.
1688	Draft	5.7.3.1	**628**	
Comment Text				**Response Text**
5.7.3.1 Nitrogen: Please add any relevant information regarding the observed nitrogen concentrations and gradients in relation to lake metals and health (i.e., a fate and transport relationship).				This relation would be connected to eutrophication effects. In that the lake is strongly limited by phosphorus, not nitrogen, the effects of nitrogen are overshadowed by phosphorus.
1689	Draft	5.7.6	**629**	
Comment Text				**Response Text**
5.7.6 Metals: 3rd paragraph - Please add median concentrations for total and dissolved metals from 1999 for comparison with previous data				Medians replaced the 1999 means, as requested.
1690	Draft	5.9	**630**	
Comment Text				**Response Text**
5 9 EXPORT OF METALS AND NUTRIENTS FROM CDA LAKE: Please add additional discharge and load tables like Table 5 9-1 to show separate seasonal loading conditions (e.g., spring, summer, fall, winter) over several years.				Such information was added to the mass balance section to show monthly loading and concentration values to augment discussion of in-lake processes. That information pertains only to 1999 data.
1958	Draft	5.7.2	**627**	
Comment Text				**Response Text**
A discussion linking the relationship of hardness to water quality criteria would be appropriate. As is evident by the data the hardness is relatively low, which influences the ambient criteria for metals. AWQC should reflect actual hardness conditions.				See Part 1, Section 5 on the use of hardness values to calculate ambient water quality criteria.
2335	Draft	1.2	**206**	
Comment Text				**Response Text**
1674: There still remains a need for direct discussion of Lake water quality conditions. Part 1 does not appear to satisfy this point and the reader should not be expected to rely on the lake management plan document for this information.				Due to the extensive detail in the Lake Management Plan, it has not been summarized in Part 1 or Part 5; however, a copy of the Executive Summary of the 1996 document has been included as an Appendix to the Final RI.

Coeur d' Alene Basin - Remedial Investigation
Draft
Comments by Commenter
John Roland

Comment No.	Version	Subsection / Add'l Ref	Doc ID	
Coeur d'Alene Lake				
5-CSM Unit 4, Coeur d'Alene Lake				
2336	Draft	4.1.1	207	
Comment Text				**Response Text**
1677: Regardless of the need to limit the size of the report, the distal receiving waters such as Lake CdA and the Spokane River should include a water quality discussion that states how these waters violate federal standards.				See Section 1 1, Watershed Description, for a summary of ambient water quality criteria exceedences. Text in Section 5.7 added to highlight ambient water quality exceedences and tables in Section 5.7 modified to show exceedences.
2337	Draft	5.1	208	
Comment Text				**Response Text**
1678: The point of this comment for this part of the report is that nutrients are important contaminants of concern for the Lake and a brief summary discussion of those conditions and sources is important in the context of lake geochemistry.				Text added in section 5.0 to clearly state that cadmium, lead, and zinc cocenctrations have been observed at concentrations exceeding AWQC and the nutrient loading has been identified as a water-quality issue in the Lake Management Plan.
2338	Draft	5.3.3	209	
Comment Text				**Response Text**
1685: Again, nutrients are an important constituent deserving discussion.				Text added to section 5.0 identifying sewage treatment plants in the basin as major sources of nutrient loading tot he lake.
Lower Coeur d'Alene River				
4-CSM Unit 3, Lower Coeur d'Alene River				
1671	Draft	2.1.6	610	
Comment Text				**Response Text**
2 1.6 Mining History: An important detail that does not seem to be present in the RI is a clear map figure(s) showing precisely where the area of dredge spoils are deposited. Also, the location of the Pine Creek tailings dam, the dredged section of the river, and any other important historical features is requested.				New map 2.2-2 provided.
1672	Draft	2.2.4	611	
Comment Text				**Response Text**
2.2.4 Surface Water/Groundwater Interaction: The topic of seeps and baseflow recharge to the river is a very important consideration for remedial planning. Any details of existing knowledge should be incorporated so a clear, detailed understanding of the limitations of our understanding of conditions along this portion of the river can be realized.				The known studies are summarized in this section. Limited information is available.
1673	Draft	3.0	612	
Comment Text				**Response Text**
3.0 SEDIMENT TRANSPORT PROCESSES: Other sediment sources deserving identification and discussion are river bedload and suspended load.				River bed load and suspended load are materials that are actively being transported. As such they are not sources of transported sediment, they are transported sediment.
2334	Draft	3.0	205	
Comment Text				**Response Text**
1673: The concept of sediment transport is a matter of perspective. Downstream recipients view mobilized bedload and active suspended load as part of the transport process. This relationship is important and relevant to the discussion.				Mobilized bedload and active suspended load are part of the transport process, however, as defined in this report, sediment is comprised of suspended (fines and sand) and bedload. They are NOT sediment sources. Sources of sediment are: erosion of

Coeur d' Alene Basin - Remedial Investigation
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John Roland

Comment No.	Version	Subsection / Add'l Ref	Doc ID	
Lower Coeur d'Alene River				
4-CSM Unit 3, Lower Coeur d'Alene River				
				riverbanks, tributary channel sediment, and mining wastes. For consistency throughout RI Parts 1 through 7, the definition has not been changed.
South Fork				
3-CSM Unit 2, Midgradient Watersheds				
1667	Draft	2.2.1.3	**66**	
Comment Text				**Response Text**
2 2.1 3 Groundwater Level Fluctuations: An expansion of the discussion relative to Kellogg and the Bunker is sought, particularly in reference to water level and other hydraulic conditions as they pertain to remedial options that may include hydraulic controls and fate & transport considerations.				As EPA progresses through the Basin RI/FS process, activities within the BHSS and the Basin will be integrated. Hydraulic conditions will be considered during this process.
1668	Draft	2.2.4	**67**	
Comment Text				**Response Text**
2.2.4 Surface Water /Groundwater Interaction: Please expand this discussion to incorporate in more detail the USGS interaction study (i.e., Barton).				A summary of the Barton 2000 study has been added.
1669	Draft	2.2.5	**68**	
Comment Text				**Response Text**
2 2.5 Water Quality and Water Chemistry: An important aspect of the evaluation of zinc loading remedial options is an understanding of groundwater and surface-water quality upgradient of Kellogg and the Bunker. Please provide more detailed discussions of water chemistry and hydrogeologic knowledge in this portion of the valley. How this area compares with conditions surrounding the Bunker Hill is critical to remedial planning.				Groundwater studies in the Basin (outside the BHSS) have not been conducted to the level needed to address this comment. If groundwater data are necessary to support design of remedial alternatives, these data will be gathered at that time.
1670	Draft	5.2.2.1.2	**69**	
Comment Text				**Response Text**
5 2.2.1 2 Segment MidGradSeg02: 2nd paragraph – Please incorporate actual metals concentrations into the discussion, similar to that provided in the 4th paragraph. 3rd paragraph, first sentence - Should SF270 actually be related to Elizabeth Park?				The second paragraph is meant as a discussion of the changes in concentrations, mass loading, and discharge between sampling locations SF268 and SF270. Estimated expected values for all of these parameters are included in Table 5.2-1.
2331	Draft	2.2.1.3	**202**	
Comment Text				**Response Text**
1667: The desire for a few words summarizing the groundwater condition near the Bunker is still justified. Also please include an explanation in this discussion that spells out how investigations are conducted in the Box relative to the Basin-wide work thus far and current investigation limitations.				Information from EPA's five-year review of the BHSS (2000) summarizing the exisiting data has been added to section 2.2.5.
2332	Draft	2.2.5	**203**	
Comment Text				**Response Text**
1669: Okay, if groundwater studies have not been conducted to the level needed then make such a current-status statement in the report.				Text modified as per comment.

Coeur d' Alene Basin - Remedial Investigation
Draft
Comments by Commenter
John Roland

Comment No.	Version	Subsection / Add'l Ref	Doc ID

South Fork

3-CSM Unit 2, Midgradient Watersheds

2333 Draft — 5.2.2.2 — **204**

Comment Text

1670: The jump in zinc loading estimates over the SF268-270 reach is significant and should be discussed.

Response Text

Text modified to indicate that this reach encompasses the impacted floodplain and the Central Impoundment Area.

*** No Watershed ***

0-Comment Pertaining to Entire Document

1662 Draft — **61**

Comment Text

The application of the proposed basin-wide screening levels is inappropriate for Lake CdA and Spokane River where background is lower than in other portions of the basin above the lake.

Response Text

Background concentrations have been developed for the upper basin, lower basin, and the Spokane basin. Screening levels have been revised to reflect these differences in the basin.

1-Setting and Methodology

1663 Draft — 2.6 — **62**

Comment Text

Please review the comments provided for PART 6, and revise this discussion as appropriate. The following are selected additional comments:

The use of graphs (e.g., histograms) to show and summarize concentration conditions relative to background and screening levels would be very helpful.

1st paragraph – Consider changing first sentence to: "CSM, Unit 5, the Spokane River…political boundaries, a major dam, and the predominant…".
Change last sentence: "CSM Unit 5 has other important features that…water supply for the Spokane area and the presence of six hydroelectric dam facilities".

2nd paragraph – Consider changing the first sentence to: One author has estimated that the Rathdrum Prairie-Spokane Valley Aquifer receives…."

3rd paragraph – Please add more specificity to address water quality exceedences along the river. Note, also, that data evaluation may indicate that depending on the season the metals AWQC below Long Lake may not, or may be exceeded. Below Barker Road bridge the metals criteria may not be exceeded in the summer months.

4th paragraph – Locally, arsenic also has accumulated in the sediments at levels of concern (e.g., above Upriver Dam).

Response Text

Text edited for consistency with Part 6.

The results of the comparison of site data to background and screening levels are included in detail in the separate watershed reports (Section 4.1 and Attachments 2 and 3).

No reference to who the "one author" is so text not revised.

Water quality exceedances along the river are addressed in Part 6.

1664 Draft — 2.6.1 — **63**

Comment Text

2.6.1 Segment 1, Spokane River from CdA Lake to the State Line:
Suggestion, simplify second sentence to: "The reach above Post Falls is artificially regulated by Post Falls Dam".

Response Text

Text modified as per comment.

Coeur d' Alene Basin - Remedial Investigation
Draft
Comments by Commenter
John Roland

Comment No.	Version	Subsection / Add'l Ref	Doc ID

*** No Watershed ***

1-Setting and Methodology

1665 Draft — 2.6.2 — **64**

Comment Text

2.6.2 Segment 2, Spokane River from the State Line to Long Lake:
Please revise these discussions following the revisions sought in PART 6.

The following tracked potential edit concepts are provided to assist with revisions:

Segment 2 of CSM Unit 5 contains both free-flowing reaches and backwaters behind low dams.
The backwater areas are places where the greatest volumes of fine-grained sediments are deposited. Exchanges of water between the river and the aquifer occur throughout Segment 2. Concentrations of dissolved zinc exceed ambient water quality criteria over portions of this reach through most of the year, and concentrations of dissolved lead exceed the ambient water quality criteria during high flows. Fine-grained sediment in natural depositional areas along free-flowing reaches, including places used for water-contact recreation, has elevated concentrations of lead above natural background and in some locations above human health screening levels. The main depositional areas are behind Upriver Dam, behind the low dams at Spokane Falls in Spokane, and behind Nine Mile Dam downstream from Spokane. Pockets of fine-grained sediments are located behind boulders and on small beaches throughout the segment. The backwater areas behind the dams contain small amounts of habitats habitat areas such as riparian wetlands, that are otherwise nor common along the Spokane River. Hangman Creek enters the Spokane River just west of downtown Spokane. The flow and water dilution contributed by Hangman Creek is typically small, but substantial amounts of clean sediment low in metals and water flow volumes are discharged during high spring flows.[expand discussion of the significance of this to the system and fate and transport]

Response Text

Text modified as per comment.

1666 Draft — 2.6.3 — **65**

Comment Text

2.6.3 Segment 3, Long Lake and the Spokane Arm of Lake Roosevelt:
Please revise these discussions following the revisions sought in PART 6.

Segment 3 of CSM Unit 5 consists mainly of Long Lake, a prominent reservoir on the Spokane River, and the Spokane Arm of Lake Roosevelt. The Little Spokane River enters the Spokane River near the upper boundary of Segment 3. Concentrations of dissolved metals in the water of Segment 3 generally do not exceed ambient water quality criteria. Concentrations of metals lead in the sediment of Long Lake are slightly elevated. Concentrations of metals in the upper part of the Spokane Arm of Lake Roosevelt are slightly elevated (mainly zinc). Concentrations of zinc in Long Lake sediments are substantially elevated above background. Zinc in sediment samples collected from the Spokane Arm of Lake Roosevelt is intermittently elevated above background.

Response Text

Text modified as per comment.

2330 Draft — 2.6 — **201**

Comment Text

1663: The point of the requested "One author" statement is that the interpretation is based on one reference. Please note that this is one interpretation and as such include the source/reference in the text.

Response Text

Text modified as per comment.

7-Summary

1722 Draft — General — **662**

Comment Text

General – Please revise this PART to reflect pending revisions identified in this complete package of comments.

Response Text

Comment noted.

Coeur d' Alene Basin - Remedial Investigation
Draft
Comments by Commenter
John Roland

Comment No.	Version	Subsection / Add'l Ref	Doc ID
* No Watershed *			
7-Summary			
1723	Draft	2.1	663

Comment Text

3rd paragraph – Add a mines location map.

Response Text

There are more than 1000 source areas in the basin that were identified in approximately 100 11x17 figures throughout the RI.

New Figure 5.1.1-1 has been added to Section 5.0 showing the locations of the major source areas evaluated in the FS.

1724	Draft	2.3	664

Comment Text

There is no discussion of the Spokane and CdA tribal nations, their locations, and relationship to the RI.

Response Text

A brief summary of the CDA and Spokane tribe demographics has been added to Part 1, Section 1.3. A discussion of the tribes' relationship to the EPA and the RI is already included in Part1, Section 1.1.

1725	Draft	3.1	665

Comment Text

Release mechanisms – Secondary mechanisms are missing such as bedload transport, remobilization of in-channel sediments, remobilization due to sediment benthic flux, etc.

See comments on PART 6 concerning a site conceptual model.

Response Text

This section is meant as a brief summary. Details are included in the CSM discussion in Part 1.

1726	Draft	3.2.1	666

Comment Text

3.2.1 Determination of Background Metals Concentrations:
2nd paragraph – There is sufficient data to develop estimates of background for groundwater in the Spokane Valley-Rathdrum Prairie Aquifer and this information should be included in the RI.

Response Text

Groundwater data sets for the Spokane River were not compiled as part of this RI, therefore, there are no data in the database to screen new background values against.

1727	Draft	4.1	667

Comment Text

The geology/geochemistry summary and geologic history for Lake CdA and the Spokane River portions of the basin are absent. Please add.

Response Text

This section is meant as a brief summary. Please see the detailed geochemistry write-up in Part 1.

1728	Draft	4.4.3	668

Comment Text

4.4.3 Main Stem and Lower CdA River:
1st paragraph, fifth sentence Recommended revision to more appropriately describe conditions:
"Groundwater is a concern where it discharges to the river from contaminated bank and floodplain sediments."

Response Text

Text modified as per comment.

1729	Draft	4.4.4	669

Comment Text

4.4.4 CdA Lake and Spokane River:
Please include discussion of the significant amount of hydraulic continuity and the significance and presence of losing and gaining reaches.

Response Text

An investigation of losing and gaining reaches of the Spokane River has not been performed, therefore, a discussion of these processes in any detail cannot be provided at this time.

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Comment No.	Version	Subsection / Add'l Ref	Doc ID
	* No Watershed *		

7-Summary

1730 Draft — 4.5 — **670**

Comment Text

7th paragraph – Please apply the following edits, or similar:
"Free-flowing segments of the Spokane are noted for the lack of fine sediments and the river's "armored" gravel and cobble dominated bed surface. Fine-grained, metals-laden sediments that may be deposited within the interstitial spaces of the tightly packed armored substrate of the riverbed throughout its shallow reaches are not readily accessible, nor are they believed to represent significant quantities potentially available for remedial considerations." Fine sediments do, though, locally accumulate in lower energy eddies along the shorelines, as bars and beaches within the braided segment of the river near stateline, backwater pockets, and in reservoirs created by the dams distributed along the river. Upstream of Hangman Creek limited sediment accumulates in the river channel because relatively little sustained fine-grained load is transported into, or residing in the river. Below the confluence with Hangman Creek substantial suspended sediment mass is introduced and fine-grained pronounced sediment accumulates behind down-river dams, particularly Long Lake.

8th paragraph, last sentence: Please modify: "Bedload may move only occasionally (e.g., seasonal high flows or flood events) and is generally stable".

Response Text

Text modified as per comment.

1731 Draft — Table 4.5-1 — **671**

Comment Text

Table 4.5-1 – Could this approach be applied for the Spokane River.

Response Text

Yes, given the correct type of available data. Data presented in this table came from a USGS study that specifically focussed on measuring suspended and bedload sediment quantities.

1732 Draft — 5 — **672**

Comment Text

5.0 SUMMARY OF FINDINGS:
A summary of Spokane River water quality and sediment conditions is missing.

Note: Thirteen of 25 pages of this SUMMARY are dedicated wholly to Lake Coeur d' Alene. A more balanced discussion is needed.

Response Text

Modeling results for the Spokane River surface water sampling locations are presented in Section 5.3.

The CDA Lake discussion will be reduced to provide a more balanced summary.

1733 Draft — 5.3.3 — **673**

Comment Text

5.3 SURFACE WATER:
5 3.3 Concentrations:
3rd paragraph, end – The statement that lead concentrations are less than screening levels in the Spokane River is not correct. It fails chronic criteria seasonally.

Response Text

For clarification, the term "estimated expected" inserted in front of the referenced statement as in paragraph #1. The estimated expected total lead concentrations at the various locations on the Spokane River are well below the screening criterion of 15 ug/L for total lead given in Table 4-1. Statement inserted that chronic criteria may be exceeded seasonally and reference the TMDL document from Ecology 1998.

1734 Draft — 5.3.5 — **674**

Comment Text

5 3.5 Mass Loading:
1st paragraph - Are the mass loading results exhibited by figures 5.3 2-2 through 5.3 5-10 based on an average cfs? Explanation and discussion of calculation limitations are needed.

Response Text

The mass loadings presented in this section are based on an "estimated expected" or average value predicted by the probabilistic modeling (see paragraph 1).

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Comment No.	Version	Subsection / Add'l Ref	Doc ID	
	* No Watershed *			

7-Summary

4th paragraph – The prominence and significance of the Bunker Hill/Kellogg area to the mass loading of zinc deserves far greater discussion and emphasis.

Text already states that the BHSS can account for up to 70 percent of the observed loading in the South Fork.

2347 Draft | 3.1 | **2018**

Comment Text

1725: Part 7 is a summary that will likely be the only level of detail that many public readers will reach. As such, it is important to include certain pertinent details in this discussion, like secondary mechanisms.

Response Text

Text modified as per comment.

2348 Draft | 3.2.1 | **2019**

Comment Text

1726: Note: For the revised response please remove the following portion of the statement: "this task is beyond the scope of the RI. Additionally,"

Response Text

Response text modified as per comment.

2349 Draft | 4.1 | **2020**

Comment Text

1727: Similar to comment no. 1725, if brief geologic summaries are deemed important for other portions of the basin then such should be the case for the lake and Spokane River.

Response Text

Brief geologic summaries were included for the upper basin because the source of the contamination is mining and subsequent release of metals from the formations identified in the upper basin. The underlying geology of the lake and the spokane river have not been identified as primary sources of metals contamination to the lake and the Spokane River, therefore, the geology of these areas is not a focus of this discussion.

2350 Draft | 4.4.4 | **2021**

Comment Text

1729: There are references on losing and gaining conditions in the upper portion of the river and this level of detail is appropriate for the Spokane River portion of the RI.

Response Text

A brief summary of the new information provided by Ecology on losing and gaining reaches has been added to this section. More details were also added to Part 6, Spokane River watershed report.

2351 Draft | Table 4.5-1 | **2022**

Comment Text

1731: Please include an evaluation of suspended load for the Spokane River in Table 4.5-1.

Response Text

Data are not available for inclusion in this table.

2352 Draft | 5 | **2023**

Comment Text

1732: Similar to comment no. 1725, above, This summary should include certain highlights and a Spokane River discussion is appropriate.

Response Text

Although the results for the Spokane River are included in the discussions in sections 5.3.1 through 5.3.7, a new summary section has been added (Section 5.3.9).

2353 Draft | 5.3.5 | **2024**

Comment Text

1734: Since Part 7 will be effectively read by many as stand-alone document, then the inclusion of an abbreviated explanation of aspects of the mass loading modeling seems appropriate and necessary.

Response Text

A description of the modeling method has been included in section 5.3.1.

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Comment No.	Version	Subsection / Add'l Ref	Doc ID

Spokane River

0-Comment Pertaining to Entire Document

1702 Draft | 3.2.2 | **642**

Comment Text

3 2.2 Segment SpokaneRSeg02:
2nd and 3rd paragraphs - First sentence, change to or similar to: "From the Centennial Trail bridge near Myrtle Point to Upriver Dam the channel forms a backwater caused by the dam."

Revise last sentence to read similar to: "Sediment derived in segments SpokaneRSeg01 and 02 would be expected to accumulate in the lower energy environment of the dam backwater".

In the 3rd paragraph change to or similar to: "From Upriver Dam down to the Upper Falls and Monroe Street dam facilities at Riverfront Park the channel is in backwater from about river mile 76, near Mission Park down to Riverfront Park in downtown Spokane. Additional deposition of sediment may occur over the quiet-water portion of this reach, but is probably small due to deposition above Upriver Dam and low sediment load."
Hangman Creek – An important study was conducted by the Spokane County Conservation District, which studied sediment loading in Hangman. This document should be evaluated and used in this discussion. It is important to discuss the tremendous load introduced by this drainage. The entry of this tributary causes a major change in the influence of lead in the sediments.
[Report is attached]

Response Text

Text modified as per comments

Results for Hangman Creek added.

6-CSM Unit 5, Spokane River

1691 Draft | general | **631**

Comment Text

General:
The observations made by Grosbois and Horowitz on Spokane River cores are critical to describing the contaminant and sediment depositional history in the river behind the dams.
Also, regression graphs of sediment load vs. discharge as done by Clark and Woods in other portions of the basin are requested for the Spokane River.

The inclusion of summary information on metals concentrations in sediments and beach deposits such as the map figure used in the FSPA 18 report is requested in the revisions. Also a map figure that highlights the areas where fish spawning beds exist in relation to sediment sampling results is requested.

Please review the aerial photos and report on the existence of the fluvial bars and braiding in the upper river near stateline. This is important because this is the only zone within this part of the river where notable volumes of fine-grained sediments have accumulated (and, as such, where the highest metals concentrations exist).

Response Text

1) Results of the analysis of the sediment cores collected by Grosbois and Horowitz summarized in Section 3.

2) The USGS is currently not scoped to measure and evaluate sediment transport in the Spokane River. The only available sediment transport data for the Spokane River area that we are aware of are for Hangman Creek.

3) FSPA No. 18 depositional area data included in Final RI/FS. Toxic effects on salmonid eggs from exposure to metals in sediments of the Spokane River are included in the EcoRA. Physical impacts (e.g., smothering of eggs) was not included.

4) Text added to indicate braiding of stream channel near State Line and results of recent sampling of depositional areas included in Section 4.0.

1692 Draft | 1.0 | **632**

Comment Text

1st paragraph - The aquifer should be identified as the Spokane Valley - Rathdrum Prairie Aquifer.

2nd paragraph – AWQC are not just exceeded during high flows. At state line zinc is exceeded all year. See the Dept. of Ecology 1998 TMDL publication No. 98-329 and other documents.

Response Text

Text modified as per comments.

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Comment No.	Version	Subsection / Add'l Ref	Doc ID

Spokane River

6-CSM Unit 5, Spokane River

3rd paragraph, second sentence – Recommend changing wording to: "Sediment screening levels… accumulates, most notably in segment SpokaneRSeg02 upstream the City of Spokane behind dams and in reservoir sediments in segment SpokaneRSeg03."

4th paragraph, second sentence – Modify to: "As an…regarding fish consumption upstream of river-mile 61.5 and other recreational areas along the river upstream of river-mile 80 with contaminated sediments".

1693	Draft	1.1	633

Comment Text

1 1 WATERSHED DESCRIPTION – see highlighted comments in the inserted text below:

Segment SpokaneRSeg01 includes two reaches, one from Coeur d'Alene Lake to Post Falls Dam and a short reach from below Post Falls Dam to the State line. The reach above the Post Falls Dam is artificially regulated by the dam, which also regulates the level of Lake Coeur d'Alene. with higher Coeur d'Alene Lake and the reach of the Spokane River down to Post Falls Dam are artificially maintained at higher than natural water levels during low flow, and consequently the river in this area also exhibits lower water velocities. During seasonally high flows, the gates at the dam are opened and water levels over parts of the impounded reach, and upstream into Coeur d'Alene Lake, are regulated by the natural channel, as is flow in the channel. The reach from Post Falls Dam to the State line is free-flowing. Segment SpokaneRSeg02 contains both free-flowing reaches and backwaters behind low low dams. These small backwater areas are one of the places where fine-grained sediments are deposited. Exchanges Notable exchanges of water between the river and the aquifer occur throughout this segment. Concentrations of dissolved zinc exceed ambient water quality criteria through most of the year in the upper portions of the segment and exceed AWQC in lower portions during high flows associated with snowmelt events and spring runoff,. and concentrations Concentrations of dissolved zinc, cadmium, and lead typically exceed the ambient water quality criteria throughout the segment during high flows. Fine-grained sediment in depositional areas, including natural shoreline beach and bar depositsplaces used for water-contact recreation, show elevated concentrations of lead. The main depositional areas in Seg 02 are: behind Upriver Dam, potentially behind the low dam at Spokane the Upper Falls hydropower facility in Spokane at Riverfront Park, and behind Ninemile Dam downstream from Spokane. Pockets of fine-grained sediments are located behind boulders and on small beaches throughout the segment. The backwater areas behind the dams contain small amounts of habitats such as riparian wetlands, that are otherwise not common along the Spokane River. Hangman Creek enters the Spokane River just west of downtown Spokane. The flow and water dilution contributed by Hangman Creek is typically small, but substantial amounts of clean Palouse-derived sediment are discharged during high spring flows. Segment SpokaneRSeg03 consists mainly of Long Lake, a reservoir on the Spokane River created by Long Lake Dam, and the Spokane Arm of Lake Roosevelt. The Little Spokane River enters the Spokane River near the upper boundary of this segment. Concentrations of dissolved metals in SpokaneRSeg03 generally do not exceed ambient water quality criteria, except during snowmelt events and spring runoff. Concentrations of metals in the sediment of Long Lake are slightly elevated. Concentrations Sediment concentrations of metals in the upper part of the Spokane Arm of Lake Roosevelt also are slightly elevated (mainly zinc).

Response Text

Text modified as per comment.

1694	Draft	2.1.1	634

Comment Text

2.1 GEOLOGY

2 1.1 Geomorphic Setting:

Include a discussion of the Missoula Flood deposits and their characteristics, since they dominate the river and aquifer composition. Regarding the "Purcell Trench" it may be more effective to recognize it as a structural, physiographic feature that extends N-S from Canada toward CdA and that the Spokane Valley may be a westward extension of the feature.

Response Text

1) In section 2.2 the source of the Spokane Valley-Rathdrum Prairie aquifer is listed as the Spokane Floods (floods from Glacial Lake Missoula).

2) Additional text added in Section 2.1.1 on the Purcell Trench.

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1695 Draft | 2.1.5 | **635**

Comment Text

2 1.5 Metal Sources:
End of 1st paragraph - Please modify the final sentence, add a new sentence similar to the following, and revise part of the 2nd paragraph as follows:

In addition, metals could potentially enter the Spokane River system from urbanized and industrialized areas (e.g., stormwater discharge, sewage treatment plants, industrial site contamination). No significant municipal or industrial discharges capable of producing widespread metals loading exist along the river. Nor do the tributaries contribute adverse metals loads to the Spokane River. All major discharges are regulated and permitted under the Washington State Discharge Waste Permit Program (chapter 173-216 WAC) under applicable surface water laws.

Mining sites north of the lower portion of the river near the Spokane Indian Reservation represent other potential sources of metals to the river basin. No impacts to the river have been documented. The two largest…

Response Text

The comments have been incorporated into the text

1696 Draft | 2.2.3 | **636**

Comment Text

2.2.3 Surface Water/Groundwater Interaction:
Regarding the discussion of 30 percent of recharge coming from the lake and river, and the lake being the dominant of the two, this is an estimate that may not be defendable or have broad acceptance. Consider rephrasing the discussion to indicate that one author has proposed these ratios.

Response Text

Text modified as per comment.

1697 Draft | 2.2.4 | **637**

Comment Text

2 2.4 Groundwater Quality and Chemistry:
What is the basis for stating that the hardness is "high" for the aquifer? Most relative scales would not indicate high hardness.

Response Text

Text modified to include discussion of relative hardness in groundwater compared to those measured in the Spokane River.

1698 Draft | 2.3 | **638**

Comment Text

2.3 SURFACE WATER HYDROLOGY:
5th & 6th paragraphs - Segment 02 also contains Upriver Dam, which is operated by the City of Spokane (approx. rm. 80). Also, the dam below Long Lake Dam is the Little Falls facility, not Little Dam.

Response Text

Text modified as per comment.

1699 Draft | 2.3.1 | **639**

Comment Text

2.3.1 Available Information:
First sentence - There are other sources of information, so to be accurate please revise the first sentence to read something similar to: "Hydrologic information for the Spokane River watershed relied on in this report includes…"

Response Text

Text modified as per comment.

1700 Draft | 3.0 | **640**

Comment Text

3.0 SEDIMENT TRANSPORT PROCESSES:
Paragraphs 1, 2, and 4 add little to the discussion and could be deleted.

Response Text

These are general process descriptions common to all reports and have been kept to help readers unfamiliar with sediment transport processes.

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Steve Box of the USGS will be finalizing by the end of March a significant field sediment-mapping project conducted for Ecology in the summer of 2000. This work needs to be incorporated into the revised RI.

This section should include discussion of historic sediment accumulation that has occurred behind Upriver Dam and along the shorelines in the upper river where the FS is focusing.

References to the FSPA 18 XRF results and the Screening Level Human Health Risk Assessment sampling results should be included in this discussion.

The issue of historic vs. current suspended load transport and deposition should be discussed in the context of fate and transport. The USGS reports of suspended load measurements coming out of Lake CdA and by the river monitoring stations need to be incorporated into this discussion.

Also in a conceptual model context this CSM unit needs a discussion of the interpreted contrast between historic vs. current transport. Past observations presented elsewhere in the RI support that from the early part of the 20th century to sometime prior to the late 1960s sediment burden entering the Spokane River was far greater than today. Thus the vast majority of the metals-rich sediments (particularly lead) is historic. While some limited ongoing new sediment deposition is assumed to exist the suspended loads measured by the USGS indicate it is small relative to the past (see USGS discussions). There also is the likelihood of some limited remobilization of sediments already in the Spokane system. The river system is relatively stable, though, and there is no active braiding and not a pronounced amount of bar migration evident along the upper river near stateline.

1701	Draft	3.1	641

Comment Text

3.1 AVAILABLE INFORMATION:
Include USGS suspended and dissolved load reports. Also FSPA 18 and health screening reports, and pending Steve Box USGS mapping.

Response Text

FSPA No. 18 sediment data included in Section 4.0. USGS data from water year 1999 make up the majority of data included in this report so by default we have included the USGS report results. Steve Box mapping data not available at the time of this report.

1703	Draft	4.1.1	643

Comment Text

4.1 NATURE AND EXTENT
4.1.1 through 4.1.3:
The use of only 10X as screening level for discussion is inappropriate. An evaluation of samples above the appropriate screening levels and AWCQ also needs to be added to the discussion.

As discussed under previous comments the screening levels are based on flawed background assumptions and surface water criteria do not relate to actual hardness conditions. Presenting a range of AWQC values may be useful since hardness varies between stateline and the areas downstream that receive groundwater recharge.

What is meant by "soils" or "subsurface soils", or "surface soils"? The meaning and purpose of these terms are confusing. The samples collected from the Spokane system are virtually all fluvial-derived sediments. Some are in-stream sediments; others are shoreline and bar sediments. A very small percent of the samples are from floodplain deposits. Limited sediment cores were collected by USGS.

Response Text

To limit the length of the RI overall, detailed discussions on all screening level exceedences were not included. Instead the reader is encouraged to look at Attachment 2 for a view of all screening level exceedences. The text of section 4.1 has been modified to highlight surface water exceedences of 1x the screening levels. Screening levels for surface water in the Spokane River have been updated to account for increasing hardness concentrations over the length of the Spokane River.

In general, samples designated as "sediment" were collected from inchannel locations. Samples collected from unsaturated areas during sampling were classified as "soil" (from top 6 inches) or "subsurface soil" (from deeper than 6 inches). Unfortunately, data received from numerous sources and compiled in this RI were not always documented well enough to determine whether they were sediment or soil as defined by the reviewer. Matrix types were accepted as reported.

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1704 Draft — 4.2 — **644**

Comment Text

4 2 SURFACE WATER MASS LOADING:
As noted in the comments on section 3.0, a discussion of total vs. dissolved loading should be placed in the context of current conditions vs. historic conditions when loading was higher.

As noted elsewhere the USGS loading discussions should dedicate a larger discussion on relative error.

Response Text

Only surface water data from 1999 was available for inclusion in this report, therefore an evaluation of how loading has changed over time was not included in this discussion.

Uncertaintly in USGS estimates are presented in the cited references from the USGS.

1705 Draft — 4.2.2.3 — **645**

Comment Text

4 2.2 3 Groundwater Mass Loading:
The sentence states that mass loading information has not been developed. This is generally correct, but Ecology conducted metals analyses from monitoring wells in the Spokane Valley over a several-month period in 1999. Wells located directly adjacent the river were included in this study. Analytical results are provided as an attachment to these RI comments. These results will permit a more detailed RI groundwater discussion. Note that the results are from .45u filtered samples only. The results provide information on the mass transfer of DISSOLVED metals from the river to the aquifer. There may be higher concentrations in whole-water, nonfiltered water. This is particularly important for lead. The introduction of metals to the aquifer is clearly shown at the Barker Rd. area. This is consistent with the knowledge that the river is a losing reach in this portion of the river. While there is an introduction of dissolved metals to the aquifer the results suggest the concentration levels are not a risk to drinking water, but there remains the potential that whole water could be high in lead during snow melt or spring runoff events, at times. Another important consideration is the surface water results as provided by the USGS.

By considering the USGS results a comparison can be made of surface water values to drinking water standards. Lead is of particular interest because the whole water results, at times in certain years, may temporarily approach the drinking standard for lead. Please address also that several municipal water supply wells are located near the river and may capture water from the river. For example, the City of Spokane has a well production facility located adjacent Upriver Dam. Please evaluate these data and compare them with drinking water standards as part of this discussion, along with the recognition that production wells exist near the river.

Should the screening levels for groundwater be based on state and federal drinking water standards, or should they be based on existing background conditions?

For the record please discuss the 1999 Ecology groundwater data to define appropriate average or median background metals concentrations observed in the Spokane Valley in the monitoring wells not under the influence of river leakage. For example, lead will be about 0.02 ug/L and zinc will be around 2 ug/L.

Response Text

A summary of the March 2001 study is included in Section 2.2.3. Additionally, a summary of the Gearhart and Buchanan study (for EPA's wellhead protection program has also been included. Neither of these studies provides enough information on metals transport to all estimation of mass loading from groundwater to surface water.

1706 Draft — Figures 4.1-1 through 4.1-5 — **46**

Comment Text

Figures 4.1-1 through –5:
Greater detail in describing the identified water and sediment sampling locations is requested. The meaning of SR# and CUA # labels is not clearly explained to the reader. Are the SR# stations where surface water was analyzed by the USGS? SR55 is identified at stateline. Was Dept. of Ecology stateline monitoring data used at this station? Other examples are the SR70 and SR80

Response Text

All data and associated references/sources/acronyms are included in the Attachments. CUA (Common Use Areas) is defined in the legend and discussed in detail in Part 1 with descriptions of the Field Sampling Plans. The SR prefix was added to each sampling location with data used in the RI to distinguish it from locations collected

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stations. Are these sediment or surface water samples?

from other watersheds (e.g , CC for Canyon Creek, SF for South Fork).

Due to the large geographic region covered by the RI report, it is not practical to provide detailed figures showing the features requested.

Department of Ecology water quality data (if available) have not been included in this report. Surface water data included are from the USGS and high and low flow sampling conducted for the USEPA by URS/CH2M HILL for this RI/FS.

Separate figures are provided for each matrix for each watershed segment: soil/sediment and surface water in segments 1 through 3 (6 figures total showing all sampling locations for which data are shown in detail in Attachment 2.

1707 Draft — Table 4.2-1 — **647**

Comment Text

Table 4.2-1:
Are latitude and longitude coordinates provided for these mass loading stations? Can they also be given names (i.e., USGS gaging ref. nos.)?

Response Text

Coordinates for all sampling locations included in the RI are listed in Table 1 of Appendix A. Cross reference information is included in Table series 2 of Appendix A.

1708 Draft — Figure 4.2-1 through 4.2-5 — **648**

Comment Text

Figure 4.2-1 through -5:
What is the difference between SR70 and SR75? Are these actually separate water quality stations, or are they the same and both based on the USGS Spokane gage located just down stream of the Monroe Street dam facility. A reevaluation of these and other points is requested. Also, see comments below on the appropriateness of these modeled results.

Response Text

SR70 is USGS 12422000 - Spokane River Below Green Street at Spokane.

SR75 is USGS 12422500 - Spokane River at Spokane.

See: Woods. 2000. Loads and Concentrations of Cadmium, Lead, Zinc and Nutrients During the 1999 Water Year within the Spokane River Basin, Idaho and Washington. USGS.

1709 Draft — 5.1 — **649**

Comment Text

5.0 FATE AND TRANSPORT:
5.1 INTRODUCTION:
1st paragraph - AWQC for zinc also is exceeded in the segments 01 and upper portion of 02 during low flows.
2nd paragraph – Modify second sentence to: "Sediment screening…, most notably along shoreline beaches, behind small dams…"

Response Text

Text modified as per comments.

1710 Draft — 5.2.1 — **650**

Comment Text

5.2.1 Estimated Discharge, particularly the last paragraph:
The modeling has exceeded its limits and has been over applied here and does not fit reality. The river is a demonstrated losing reach from basically Post Falls to approximately rm. 90, down stream of Barker Road bridge. Error associated with the gaging rating tables, or a lack of data points may be the cause. Thus, SR 50 through 60 are in a year-around losing reach. Please reevaluate these data and the modeling to integrate known conditions.

Response Text

Text already includes discussion on the limitations of modeling results from a limited data set. Text added to include results of Ecology's 1999 study of the reach between SR50 and SR60.

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The predicted losing segment between SR65 and SR70 is feasible based on field studies in the area. One known study in that reach (Hamilton Street [Spokane Gas Plant] MTCA RI) documented the river losing to the aquifer most of the year, except during the spring runoff period (e.g., May-June). What does the 3,180 cfs prediction represent; is it an average annual predicted value? Losses are expected to vary dramatically depending on the season. During the summer and fall months there isn't even 3,000 cfs in the river. Also, for high flows the relative error associated with the gages could approach the predicted value.
This modeling is a potentially powerful predictive tool, but a sensitivity evaluation must reflect real observations and knowledge. Please critically reevaluate discharge and loading predictions.

1711 Draft | 5.2.2 | **651**

Comment Text

5 2.2 Estimated Cadmium, Lead, and Zinc Concentrations and Mass Loading:
The predicted loads are all subject to discharge errors that may be 10% at some of the stations. How does the modeling address this? Also, as mentioned above the distinction between modeling and actual observations needs to be addressed throughout.

Potentially the best segments to model, based on the existence of long-term gaging records resulting in lower error over broad flow ranges may be the following: Post Falls gage to Liberty gage; Liberty to Greene St. gage; Greene to Spokane at Spokane gage; Spokane to Long Lake. The best gages are Post Falls, and Spokane, and Long Lake.

The flow regime and time period for which the modeling applies needs to be clearly stated. Spring flows and late summer flows and metals concentrations differ drastically.

Response Text

See the intro to the modeling section 5.2, second paragraph where we acknowledge the uncertainty inherent with use of a limited dataset. Unfortunately the uncertainty itself cannot be quantified because of the inherent variability of the system and the lack of available data.

1712 Draft | 5.2.2.1 | **652**

Comment Text

5 2.2.1 Individual Sampling Locations:
2nd paragraph – The screening levels of 15 ug/L lead used for surface water is human health based. A more appropriate reference would be the aquatic life screening level, based on an appropriate hardness and AWQC for the river. This also applies to other metals such as zinc.

3rd paragraph – There is a metals TMDL for the river in Washington. It is concentration based, not load based (see attached Focus sheet, technical documents are in EPA records).

5th paragraph – The Appendix C data are subject to discharge errors and data limited modeling.

Response Text

Screening levels for surface water have been revised (See Part 1, Section 5 and Attachments 3 and 4). For dissolved metals, the AWQC are used, adjusted for segment-specific hardness values in the Spokane River. For total metals, human health-based criteria are used. For total lead the value for the MCL (15 ug/L) is used to be consistent with the Human Health Risk Assessment. See Part 1 for a detailed description of the derivation and use of screening levels for the RI.

1713 Draft | 5.2.2.2 | **653**

Comment Text

5 2.2.2 Segment SpokaneRSeg01:
1st paragraph - Are the loading estimates an annual value? Please also restate here what USGS data are used to make these predictions. Finally, this discussion is lacking recognition of seasonal variability. Can a seasonal aspect be added to the predictions?

3rd paragraph – The basis for this discussion is flawed due to model weakness (e.g., SR 50-55).

Response Text

1) No. The model takes all available surface water data regardless of date, high or low flow, and predicts an estimated expected value (average value).

2) Surface water data included are from the USGS 1999 and high and low flow sampling conducted for the USEPA in 1997 through 1999 by URS/CH2M HILL for this RI/FS.

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Last paragraph – If this lead discussion holds up after further review, it points toward secondary remobilization of lead solids in the system. Please add to discussion if appropriate following re-evaluation.				3) Concentration vs discharge was evaluated as part of the modeling effort. Dissolved zinc and total lead concentrations as a function of discharge (at the 10th and 90th percentiles and the estimated expected (average) discharge rates) are included in Part 7. Because discharge varies seasonally, this provides a link to concentration/mass loading seasonality.
1714	Draft	5.2.2.3	654	
Comment Text				**Response Text**
5 2.2.3 Segment SpokaneRSeg02: 1st paragraph - Long Lake Dam does not fit the general definition of a "low" dam. It is an impressive structure. The conclusion on zinc AWQC violations is not correct. The criteria are clearly exceeded part of the year, but there are lower portions of the segment that do not consistently violate criteria during summer base flow. A review and comparison of appropriate AWQC with changing hardness values along the river to USGS metals data will reveal the changes along the river. Recall that as the aquifer recharges the river the hardness shifts. 3rd paragraph – The conclusion that the values of zinc remain constant between SR55 and SR75 is not true for all times of the year. It is, though, most likely the case during spring runoff. It is not the same during lower flow conditions.				1) Reference to low dams removed. 2) Screening levels for dissolved surface water have been revised based on segment-specific hardness values and the AWQC. Text corrected to reflect new screening levels comparisons. 3) This section presents results of the probabilistic modeling. This observation of changes in zinc concentration with discharge are presented in the following section 5.2.2.5.
1715	Draft	5.2.2.4	655	
Comment Text				**Response Text**
5 2.2.4 Segment SpokaneRSeg03: Last paragraph – Please provide a discussion on the likely geochemical processes that are resulting in the retention of dissolved zinc in Long Lake. The works of USGS in the Spokane River and Lake CdA may provide the basis. The metals retention of Long Lake reservoir is an important fate and transport topic. Also important is the resulting drop in zinc below Long Lake, except during higher flows (e.g., seasonal runoff period, or midwinter events).				The geochemistry of lake processes (Coeur d'Alene Lake specifically but is applicable to the Lateral Lakes and Long Lake as well) is discussed in Part 1, Section 3.3.1.2. A reference to the CSM Unit 4 Lake report and a brief summary included in Section 5.2.2.1 have been added to this section.
1716	Draft	5.2.2.6	656	
Comment Text				**Response Text**
5 2.2.6 Concentrations Over Time: 2nd paragraph – On what time period is this zinc and lead load trend discussion based? Is this just for 1998 and 1999? If so, this is far too short of a period for pursuing a trend discussion, particularly if this is annual loading, which can vary considerably depending on mid-winter or spring snow melt conditions. 3rd paragraph – Are these regression plot conclusions based on just 1998 and 1999? Is this discussion really appropriate and useful?				This section deleted due to the limited set of available data and the uncertainty in the presented results.
1717	Draft	5.3	657	
Comment Text				**Response Text**
5.3 SEDIMENT FATE AND TRANSPORT: Unit 5 needs a conceptual model discussion to create a comprehensive framework for fate and transport. The model should incorporate the following components: ? Historic transport of dissolved and suspended sediment loads out of Lake CdA. ? Historic deposition of metals-rich suspended load, particularly in the upper river near state line and in quiet water pools created by the dams.				A detailed discussion on the Conceptual Site Model for the Spokane River is included in Part 1, Section 2.6. To limit the length of the RI, that section is not repeated here. Information provided in the comment is incorporated in detail into the Part 1 discussion. Section 5 text updated for consistency with this information. Sediment loading discussion revised to include USGS discharge data and sediment

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? The current condition of limited suspended load and year long dissolved zinc loading.
? The current limited deposition of suspended load.
? The potential for limited remobilization of existing metals-rich sediments, particularly in the upper river behind Upriver Dam, the beaches and bars, and limited floodplain deposits.
? The issue of zinc diffusion and geochemical processes occurring in subaqueous sediments, particularly Long Lake and the Spokane Arm.
? The influence of Hangman Creek.

2nd paragraph – Suggested modifications to the discussion are highlighted below:

Much of the sediment derived in or introduced to the Spokane River is transported and deposited in reservoirs, or locally along the shorelines of the free-flowing reaches along its length. The largest sediment sources to the Spokane River are remobilization of channel bed material, bank erosion, and tributary channels. Most of the discharge in the Spokane River is derived from the outlet of Coeur d'Alene Lake. Groundwater recharge contribution also is prominent and is particularly important in the summer and fall. This lake provides a low energy environment where much of the sediment derived from upstream sources is deposited. Some of the smallest and lightest particles remain suspended through the lake are transported to the Spokane River.

4th paragraph – The following sentence is important, but the report never really focused on or addressed these aspects in an adequate level of detail:
"The review focused on morphologic features indicating stream instability, channel migration, channel aggregation or degradation and other features that may contribute sediment to the system".

The following statement is very much incorrect: "USGS sediment transport and stream discharge data are not available for the Spokane River…" There is extensive discharge data. Suspended load data obtained by the USGS also is available.

Please consider the following changes to the last sentence in the section:
"Fine-grained suspended sediment is transported through the reservoirs; however, considerable quantities of sediment are likely deposited in the reservoirs throughout the length of the Spokane River. The largest accumulation of sediment exists in the Long Lake reservoir, with most of the sediment currently coming from Hangman Creek"

loading information for Hangman Creek.

1718 Draft — 5.4 — **658**

Comment Text

5.4 SUMMARY OF FATE AND TRANSPORT
This section will require re-evaluation and likely substantial revision based on comments provided. Also, it should include mention of sediments behind Upriver Dam and discussion of sediments that exist in other reservoirs, such as Long Lake.

Response Text

Section 5.3 summarizes sediment transport and concludes that fine-grained sediments are released from Coeur d'Alene Lake and are deposited behind dams along the Spokane River. Section 5.4 summarizes results of the probabilistic modeling for metals fate and transport in surface water. The reader is encouraged to read the complete document for details on sediment transport (Section 3.0) , metals concentrations in sediment and surface water, and mass loading (Sections 4 and 5) in the report.

1719 Draft — Figures 5.4-1 through 5.4-4 — **659**

Comment Text

Figure 5.4-1 through –4: What are these values based on? Are they average concentrations covering a water year?

Response Text

These figures show the results of the probabilistic modeling - estimated expected

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(average) values.

1720 Draft — Table 5 — **660**

Comment Text

Table 5: Please provide footnotes/legend to explain the source of the levels (i e , like was done for Table 3 2-1).

Response Text

The screening levels attachment (4) has been revised to show source of all screening levels. Screening levels for dissolved surface water have been revised based on segment-specific hardness values and the AWQC.

1721 Draft — Attachment 4 — **661**

Comment Text

ATTACHMENT 4 Screening Levels:
This discussion should be revised to address issues raised regarding appropriate background ranges for the Spokane River. Also both human health and ecological screening levels should be applied in the data evaluation.

Response Text

The screening levels attachment (4) has been revised to show source of all screening levels, including revised background concentrations for soil/sediment in the Spokane River Basin. Please refer to Part 1, Section 5.1 on the process for derivation and selection of screening levels. Human health and ecological risk-based concentrations are considered for all media evaluated in the RI.

2339 Draft — General — **2010**

Comment Text

1691: For response #2, we are interested in the suspended load, concentrations of the suspended sediments, and the relationships of suspended load vs. discharge.

Response Text

As previously stated in the response to Comment #1691: The USGS is currently not scoped to measure and evaluate sediment transport in the Spokane River. The only available sediment transport data for the Spokane River area that we are aware of are for Hangman Creek.

2340 Draft — 4.2 — **2011**

Comment Text

1704: If a quantitative discussion can not be provided, then a qualitative discussion is requested. For example, the fact that readily evident suspended load containing slimes, etc. was common in the years prior to the CWA.

Response Text

Text added to section 2.1 5, metal sources, to give a historical, qualitative description of the fine-grained tailings observed in the Lake and in the River during the 1920's (Casner 1991) compared to today's observation of concentrations exceeding AWQC.

2341 Draft — Figures 4.1-1 through 4.1-5 — **2012**

Comment Text

1706: I'm still not clear on the relationship of SR70 and SR75. This is a detail that I would like to clear up. Did USGS actually collect water samples at these two locations? Are the locations accurate? The reason being that there is a gage near (at) SR75, but SR70 is the Green St. gage (?) located much further up stream. SR55 (I think) is the gage located a couple of miles west of the state line, but the map plots it at the state line.

Response Text

These are the descriptions of the USGS gaging stations and the RI sampling locations associated with them:

SR55 - USGS Above Liberty Bridge at Otis Orchard (12419500)
SR65 - USGS SR at Sullivan Raod Bridge near Trentwood (12420800)
SR70 - USGS SR Below Green Street (12422000)
SR75 - USGS SR at Spokane (12422500)
SR80 - USGS Hangman Creek at Spokane (12424000)

2342 Draft — Figures 4.2-1 through 4.2-5 — **2013**

Comment Text

1708: If SR70 is the Green St. gage, then what is the SR65 water-sampling site? Clarification is needed.

Response Text

See response to Comment #2342.

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2343 Draft — 5.2.1 — **2014**

Comment Text

1710: This discussion is a problem. Modeling results can not be presented (even with qualifications) if they do not reflect reality.

Response Text

Additional discharge data were analyzed for sampling locations SR50, SR75, and SR85. Additional paired concentration and discharge data are not available for further refinements to the modeling. To supplement the discharge modeling results, results of two hydrogeology studies conducted by Ecology and EPA were added to section 2.2 3 and referenced in section 5.2 1.

2344 Draft — 5.2.2 — **2015**

Comment Text

1711: Concerns as above remain. The probabilistic approach appears ill fit for the current data and associated limitations.

Response Text

See response to Comment # 2344.

2345 Draft — 5.2.2.4 — **2016**

Comment Text

1715: Please, then, make reference in the applicable discussions to the relationship of Lake CdA processes to that of Long Lake

Response Text

Text modified as per comment.

2346 Draft — 5.3 — **2017**

Comment Text

1717: Please make reference to Section 2.6 in this section's discussion.

Response Text

Text modified as per comment.

Coeur d' Alene Basin - Remedial Investigation
Draft
Comments by Commenter
Julie Campbell

Comment No.	Version	Subsection / Add'l Ref	Doc ID
	* No Watershed *		

1-Setting and Methodology

2328 Draft — **191**

Comment Text

Comment number 1971: Was it determined that no FWS data sets were utilized for the RI/FS? It was our understanding that FWS flood plain sediment data were used in the RI/FS, and from reviewing Figures relating to CSM Unit 3 (lateral lakes) it appears that the data were incorporated. It seems as though the appropriate response to this comment would be to add the FWS data sources to the table, not remove the reference to FWS data. Please verify use of data, or clarify response.

Response Text

The commenter is referring to the sediment data set compiled by the USGS (Bookstrom). This set was received electronically from the USGS for incorporation into the TDM database. The accompanying USGS report did not identify any data in this electronic data set as being from the USFWS. Additionally, overlap in sample names were not found during a comparison of the sample names in the USGS compiled set with the sample names in the draft USFWS report (Metal Contamination of Palustrine and Lacustrine Habitats in the Coeur D'Alene Basin, Idaho. Campbell and Audet. May 24, 1999.)

2329 Draft — **192**

Comment Text

Comment 1974: The response clarifies specification of a hardness value of 30 in a footnote to Table 5.1-2, but does not address our comment regarding low water hardness throughout the basin. As stated in the original comment, the text in the referenced paragraph implies that a hardness of 30 mg/L is relatively low for mining affected waters in this basin, when in fact low hardness values exist throughout much of the basin. It would be helpful to revise the sentences specified in the original comment.

Response Text

1. The text in Part 1 that Comment #1974 refers to has been deleted from the RI (background surface water discussion) and is now in the Background Technical Memorandum (June 2001). However, the original statement is correct. 30 mg/L is toward the low end of the range (7 5 to 111 mg/L, 25th to 95th percentile).

2. The original comment concluded that use of a hardness value of 30 mg/L was acceptable; therefore, Table 5 2-10 (new Table 5 1-2, footnote "h") is correct.

Coeur d' Alene Basin - Remedial Investigation
Draft
Comments by Commenter
Kathy Johnson

Comment No.	Version	Subsection / Add'l Ref	Doc ID	
	Coeur d'Alene Lake			
5-CSM Unit 4, Coeur d'Alene Lake				
1324	Draft		**21**	
Comment Text		p. 1-1		**Response Text**
fourth para. Regarding the reference to the Lake Management Plan, the State of Idaho has examined state and local implementation of the Coeur d'Alene Lake Plan. The analysis found that most of the action items ascribed to the state and many ascribed to local government have been implemented. The description of actions can be found in the State Conceptual Cleanup Plan Draft 6, April 1999.				This comment has been addressed in the Proposed Plan.
1325	Draft	3	**22**	
Comment Text				**Response Text**
Geology. The geological analysis of the lake and for that matter the entire Coeur d'Alene Basin neglects the Miocene Columbia Plateau basalt flows and their influence in the creation of a larger progenitor Coeur d'Alene lake in which the Latah Formation was laid down. This is discussed in "Andersen, A.L 1927. Some Miocene and Pleistocene drainage changes in northern Idaho. Bureau of Mines and Geology. State of Idaho, University of Idaho, Moscow ID. 29p."				Detailed information on the geology of the Coeur d'Alene Basin is available in numerous technical documents available for review. Therefore a more detailed discussion on geology of the Basin, beyond what is already included in Part 1, has not been added.
1326	Draft	3	**23**	
Comment Text		p. 3-3		**Response Text**
Some caution should be exercised in the describing the plume passage over Coeur d'Alene Lake by the extrapolation of scanty data to a general conclusion. Although the point is made that water year 1999 had discharge conditions that are statistically near the mean, typical discharge conditions are a statistical concept rather than the real situation.				Revisions to text have pointed out short-term nature of these overflows and their strong dependence on discharge conditions. The data may be "scanty", but the hydrologic processes have been in operation a long time and the available data are adequate to support these conclusions.
1327	Draft	4.1	**24**	
Comment Text		p. 4-1		**Response Text**
Why were so few samples and their analysis used to characterize the nature and extent in this section? Why not use all of the data collected on the Lake?				Some USGS data was inadvertently left out of this section on nature and extent. It will be incorporated in the final draft.
1328	Draft	4	**25**	
Comment Text		p. 4-1		**Response Text**
third para. The maps in Figures 4.1-1 through 4.1-5 do not include the surface water sampling locations in Seg02.				Some USGS data was inadvertently left out of this section and the associated maps. That oversight will be corrected in the final draft.
1329	Draft	4.1.2.2	**26**	
Comment Text		p. 4-2		**Response Text**
Provide the number of sampling locations where the metals exceeded 10x the screening levels rather than referring to "many" locations.				When the missing USGS data is added into this section, the number of sampling locations will be provided, as requested.
1330	Draft	4.1.2.3	**27**	
Comment Text		p. 4-3		**Response Text**
Provide the number of samples exceeding the screening levels. Also, check the tables providing the data for this section in Attachment 3. There are 2 pages titled Surface Water Segment CDALake Seg02, although one of them looks like it might be Surface Soil, but if it is the number of samples doesn't match that given in Section 4.1.2.1. In addition, the one sample with a zinc concentration of 670 ppb is highly unusual in the Lake unless it is directly at the River's outflow. A description of where this sample is from would be informative (note that the map of these surface water sampling locations was omitted).				A few adit sampling locations technically within the boundary of this watershed segment are shown in Attachment 2. A figure showing these locations relative to the lake has been added to this section. Because not all lake surface water data collected by the USGS were added to the TDM database for use in the RI, results for data managed within the TDM database and other

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Comment No.	Version	Subsection / Add'l Ref	Doc ID	
	Coeur d'Alene Lake			
5-CSM Unit 4, Coeur d'Alene Lake				
				USGS data sets are presented in detail in Section 5. The data tables and figures in this section have not been updated to reflect other USGS data sets.
1331	Draft	5.2.3	28	
Comment Text		p. 5-7		**Response Text**
This section would benefit from more specificity; i.e. for example the temperature difference that is thought to be significant should be stated in degrees. Also, the effect of different loads of suspended sediment between the river inflow and the lake should be accounted for in the density evaluation.				Text was added to describe the decision process used to ascertain temperature differences as well as how lake temperature profiles were extrapolated. Statement was added about effect of suspended sediment on density, also note the lack of such data.
1332	Draft	5	29	
Comment Text		p. 5-9		**Response Text**
second para. The meaning of this paragraph is not clear. Is the first sentence suggesting that in years 1996 and 1997 the load in the riverine inflows was essentially all carried through the Lake? If so, this is inconsistent with the results calculated from inflow and outflow data that show 96% and 92% of the lead load retained in the Lake in 1996 and 1997, respectively. To what conceptual model is the last sentence referring?				Text was revised to clarify this issue and make it clear that inflows do not always traverse the lake. Discharge is a large determinant of that process. The conceptual model being referred to is based on discussions with scientists who have worked in the basin and have conjectured that it takes large discharge events to push the CDA River's plume the length of CDA Lake.
1333	Draft	5	210	
Comment Text		p. 5-9		**Response Text**
third para. The connection between this text and the referenced Tables would be easier if the "L" locations were included in the Table to match the descriptions used in the text. To facilitate understanding of the data distributed spatially and with depth consider adding a 3-D sketch with the data displayed on it.				The locations labeled Lxx were added to the subject tables to improve clarity. The addition of a 3-D sketch was judged to be unnecessary.
1334	Draft	5	211	
Comment Text		p. 5-14		**Response Text**
Although the conflict in phase association work between Harrington et al, and Horowitz is discussed briefly, the major part of the work of Dr. Frank Rosenweig and his students (among them Harrington) is ignored. Biologically mediated deposition of metals into insoluble chemical forms (sulfides) plays an important role in the fate of metals in the lake sediments. It is important to inform the reader of this body of work completed on Coeur d'Alene Lake bed sediments.				The research of Harrington and Rosenweig was considered by Kuwabara for the benthic flux studies and is discussed in that report. However, Rosenweig's work was conducted only in the area near the CDA River's inflow and delta. The wider spatial coverage available for the benthic flux and peeper studies was more useful in discussions of benthic flux versus riverine flux.
1335	Draft	5	212	
Comment Text		p. 5-14		**Response Text**
middle para, last sentence. The word "surface" should be inserted to describe the lakebed sediments.				Done.
1336	Draft	5	213	
Comment Text		p. 5-15		**Response Text**
In comparing the results of Harrington and Horowitz it is noted that Harrington's samples were obtained primarily in or near the deltaic deposits while Howowitz's samples were obtained throughout the Lake. For this difference to be relevant, the consequences of the sampling different areas must be explained.				The discussion of sedimentation covered the differences in deposition and post-depositional scouring between the delta area and the rest of the lake. The relevance is that Horowitz's data represent nearly the entire lake, whereas Harrington's represent less than 10 percent of the lakebed surface area.
1337	Draft	5	214	
Comment Text		p. 5-16		**Response Text**
Rational for selecting the locations of benthic flux studies should explained.				Such was stated in Kuwabara's report and was mentioned in discussion of benthic flux

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Coeur d'Alene Lake				
5-CSM Unit 4, Coeur d'Alene Lake				
				studies.
1338	Draft	5	215	
Comment Text		p. 5-17		**Response Text**
Discussion on the benthic flux measurements would be improved by a brief description of the in-situ methods of measurement of metal concentrations because of the known limitations of these measurements.				Metals were not measured in-situ, they were collected as samples and analyzed in an ultra-clean lab facility.
1339	Draft	5	216	
Comment Text		p. 5-19		**Response Text**
second para. Providing the sulfate concentrations characterizing the profiles that are referenced would strengthen this discussion. Also noting that sulfides form as sediments act as a sink for sulfate would be useful to the reader.				Sulfate concentrations were discussed in the text and tables and the effect of sulfide formation was discussed under diagenesis.
1340	Draft	5.5.5	217	
Comment Text		p. 5-20		**Response Text**
first para. Please explain what is meant by "representative" when describing the benthic flux measurements relative to the entire Lake? Also, it is important to inform the reader that benthic flux varies throughout the year and this study only measured one time.				The representativeness of the August, 1999 measurements at two locations was discussed relative to lakebed metal concentrations measured by Horowitz throughout the lake. The two benthic flux locations had metals similar to those measured throughout the lake. The temporal variability of benthic flux was discussed in several locations within the text. In the mass balance discussions, the uncertainty associated with benthic flux in a spatial and temporal context was highlighted.
1341	Draft	5	218	
Comment Text		p. 5-21		**Response Text**
first para. Is the assumption of zero for dCdissolved and dCparticulate appropriate for the Lake because of the declining concentrations over time?				The assumption was used in a mass balance modeling concept for one year; data were presented to support the lack to significant change in concentrations for that particular year. The assumption that concentrations are declining over time is open to discussion in that such changes may represent artifacts in sample collection timing and representativeness of depths sampled.
1342	Draft	5.7.6	219	
Comment Text		p. 5-30		**Response Text**
This section is very confusing – it is crying out for a Table comparing the 1991-92 study, the 1995-99 IDEQ data, and the 1999 study.				Agree. A table was added that combines these data and text was revised to direct reader to the new table.
1343	Draft	5	220	
Comment Text		p. 5-31		**Response Text**
first para. The sentence describing the zinc concentrations has the total zinc (74ug/l) less than the dissolved zinc (79ug/l). Is this correct?				Yes, those values are correct. They are within 10 percent which is within the analytical method's precision.
1344	Draft	5	221	
Comment Text		p. 5-31		**Response Text**
third para. Explaining the gradients of metal concentrations should also mention settling of particles and the associated metals. Keep in mind that the Lake is a sink for about 90% of the lead and about 50% of the zinc. These metals have to get from the surface to the sediments.				Agree. Text was revised in appropriate areas to better emphasize the retention of metals via settling through the water column.

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Comment No.	Version	Subsection / Add'l Ref	Doc ID	
Coeur d'Alene Lake				
5-CSM Unit 4, Coeur d'Alene Lake				
1345	Draft	5	222	
Comment Text		p. 5-38		**Response Text**
Table 5 1-1. How were the data with metal concentrations less than the detection limit handled? Especially for cadmium where most of the data before 1999 were less than detectable, this could affect the results of this calculation.				Such concentrations were assigned a value of 0 5 ug/L. In order to evaluate the effect of this assignment, the number of assigned values was note both in the text and as footnotes to tables containing such values.
1346	Draft	5	223	
Comment Text		p. 5-44		**Response Text**
Table 5.2-3. Per previous suggestion, add the "L" numbers to the sample locations.				Agree, L numbers were added to affected tables.
1347	Draft	5	224	
Comment Text		p. 5-55		**Response Text**
Table 5 5-4. I suggest expanding the "a" footnote to explain that this annual flux is estimated from a single measurements from only two locations.				Agree, footnote modified as suggested.
1348	Draft	5	225	
Comment Text		p. 5-69		**Response Text**
Table 5 9-1. The loads of metals presented in this Table appear to be affected by using data that is less than the detection limit. This appears to apply to both dissolved and total cadmium for year's 1992-1997and dissolved lead for years 1992-1997. At a minimum the detection limit problem must be noted or perhaps the data that are less than detection limit should not be used.				Agree, footnotes were added to indicate how many concentrations reported as less than 1 ug/L were assigned a value of 0.5 ug/L.
Lower Coeur d'Alene River				
4-CSM Unit 3, Lower Coeur d'Alene River				
1749	Draft	3.0	715	
Comment Text				**Response Text**
The sediment transport concept for CSM3 advanced by the RI is incorrect. The RI indicates that sediment in that part of the river above Cataldo (lower section of CSM-2: North Fork – South Fork confluence to the Cataldo Bridge) will be transported into CSM-3. Although this will occur over time it will be quite a period of time. Below the Cataldo area the gradient of the river is sufficiently low that the river transports fine sand or smaller particles. Modeling of sediment yield in the North Fork (North Fork Coeur d'Alene River Sub-basin Assessment) indicates that nearly 60% of the sediment load in gravel or larger particle size. A similar estimate is likely for the South Fork sediment load. Thus nearly 60% of the sediment load will be deposited in the river reach between Kingston and Cataldo until it is converted to a fine sand or smaller particle size. The deposition in the river at this point resulting from accelerated erosion in the North and South Forks of the river is easily observed. Conversion to fine sand will take a substantial period. Thus the concept that the entire sediment load will be transferred into CSM-3 rapidly is flawed.				In the introduction, it is stated that one of the sources of "sediment" that is deposited in the Lower river comes from the North and South Forks. This is accurate. Details on what particle sizes are deposited are discussed in subsequent sections of Section 3.0. For example, on page 3-3, it is stated that bedload sediment transport was negligible during the sampling effort summarized in this report. This statement supports the commentors assertion. However, the first paragraph of this section states that approximately 51,000 tons or sediment were transported past the USGS gaging station at Harrison during water year 1999. This is a significant amount material, much of which contains elevated concentrations of lead as supported by total lead concentrations observed in surface water (estimated expected values of 51 ug/L and 1,500 lbs/day load at LC60) and sediment in the lower river (average detected value for Segment 06 of approximately 4,000 mg/kg).
1750	Draft	1	716	
Comment Text				**Response Text**
Page 1-1. The restoration at the Cataldo Boat Ramp included the stabilization of banks, installation of barriers and installation of a safe water supply. Assessment of recontamination of the soil barriers after the 1996 and 1997 high discharge events indicated these remained below 500 ppm lead.				Comment noted. Detailed description of the IDEQ's work already in the text in Section 1.0.

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Lower Coeur d'Alene River

4-CSM Unit 3, Lower Coeur d'Alene River

1751 Draft 2 717

Comment Text

Page 2-7. The description of the aquifers of the river valley appears to neglect the work of Alfred Arnold concerning the influence of Miocene basalt flows in the creation of an earlier and much larger Coeur d'Alene Lake in which the Latah formation was laid down. This reference is cited in our comments on the Coeur d'Alene Lake.

Response Text

Comment noted. Addition of this information seems of little practical significance to the current issue of identifying areas of contamination.

1752 Draft 2 718

Comment Text

Page 2-10. Anthony Davis of the Idaho Department of Environmental Quality's drinking water program tested the wells of the Coeur d'Alene River floodplain for metals in the early 1990's. These tests revealed metals contamination in a single well. These results are available from the Idaho Department of Environmental Quality's Coeur d'Alene Regional Office.

Response Text

Data referenced in the comment seem consistent with data from other studies presented already in the text. No text changes made.

1753 Draft 3 719

Comment Text

Page 3.1. The other prime data source on bank erosion is the Natural Resource Conservation Services (then the Soil Conservation Service) Coeur d'Alene River Basin Study of 1994. This reference indicates the importance of boat wakes as a mechanism of bank erosion. Wesche's bank erosion inventory is based on an inventory developed by the USGS and IDEQ in 1994.

Response Text

Text modified as per comment.

1754 Draft 3 720

Comment Text

Page 3.6. Boat wake erosion of bank is not mentioned as an important factor. The river basin study mentioned earlier documents this mechanism.

Response Text

Text on page 3-5 modified to include boat wakes as potential cause of erosion.

1755 Draft 3 721

Comment Text

Page 3.7. The document refers to Cave Creek. No Cave Creek exists as a tributary to the lower Coeur d'Alene River. The text is likely referring to Robinson Creek, which enters the river near the Medimont Boat Ramp. This stream has also been called Evans Creek in some documents.

Response Text

Text has been modified.

1756 Draft 4 722

Comment Text

Page 4.2. The RI refers to "one to many" exceedences. The document should state exact numbers of exceedences. For some parameters, draft state water quality guidance allows exceedence 10% of the time. Such assessments cannot be made with qualitative values as "one to many."

Response Text

For clarity and efficiency for the reader, specific exceedences are presented for each sample in the tables of Attachment 2 and summarized in Attachment 3. To limit the length of the RI, all exceedences were not called out and discussed in the text.

1757 Draft 4 723

Comment Text

Page 4-6. The high discharge event referred to is not clear. Is this the 1996 rain on snow event of late February and March 1996 or the spring snow melt event of April, May and June 1997? This makes a great difference. The 1996 event was accompanied with a great deal of flooding of the river's floodplain. The 1997 melt resulted in sustained high discharges, but did not flood large areas of the flood plain.

Response Text

The flood was documented in May 1997.

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Comments by Commenter
Kathy Johnson

Comment No.	Version	Subsection / Add'l Ref	Doc ID

Moon Creek

2-CSM Unit 1, Upper Watersheds

1740 Draft — 76

Comment Text

It should be noted that much of the work done in Moon Creek was on the Silver Crescent tailings pond. In general, the point of this write-up is unclear. The meager data presented and analyzed pre-dates (1997) the remediation work (1998, 1999, 2000) done by the USFS. If the point is to characterize the pre-existing conditions then John Specht, USFS, could provide much more data from the USBM on the Silver Crescent/Charles Dickens complex.

Response Text

Ninety surface water samples have been collected from location MC262 from 1991 through fall of 1999. Concentrations of dissolved zinc in late 1999 continue to exceed AWQC despite the work at the Silver Crescent tailings pond. The point of this write-up is to identify media with metals concentrations greater than applicable screening criteria. Exceedences are shown in Attachment 2 and discussed in Sections 4 and 5.

*** No Watershed ***

1-Setting and Methodology

1739 Draft — 75

Comment Text

Page 3-5, Section 3.2 1.1. The geomorphic description of the streams in CSM 1 and 2 needs to include the geologic conditions that constrain segments of the tributaries and the South Fork through out their reaches. The bedrock, alternating between pinching in and out creates constrained narrows between wider shallow reaches with more of a braided character.

Response Text

Text modified as per comment.

7-Summary

1735 Draft — 71

Comment Text

Page 1-1. Considerable effort is expended to explain the volume of mine wastes impacting the Basin. It would be appropriate to also have discussion about the relative toxicity or hazard associated with this type of waste. The Bevill Amendment to RCRA identified mine wastes as high volume, low toxicity wastes. The RI makes it clear that there is a high volume of material, but there is no discussion about the toxicity. It is important to put the hazard associated with the waste in perspective for the public that has a difficult time differentiating the risk between plutonium and a galena nugget. One perspective is that the unique problem in the CDA Basin is a combination of high volume and relatively low toxicity materials. The level of toxicity is on a continuum with some materials having negligible impacts on the environment to some having a significant impact on the environment. The impacts are not only dependent upon the toxicity but also the location of the material factors that influencing release, proximity to receptors, etc. As a side note: It is probable that the low toxicity of the material helped contribute to the large volumes of disposed wastes. The public would likely not have tolerated a higher toxicity material to be so widely distributed in such large volumes if they were able to see direct and immediate impacts from exposure to the material.

Response Text

Text added to Part 1, Section 1.0 to include basic toxicity information for the risk drivers (Cd, Pb, Zn, and As).

1736 Draft — 72

Comment Text

Page 3-3, Section 3 2.1. Since many people may only read the summary section, it is recommended that a table showing background concentrations be included in Section 7.

Response Text

Summary table of background concentrations added to Section 3.2 1 and included in the screening levels summary tables (where used as screening criteria) in Part 7.

1737 Draft — 73

Comment Text

Page 4-1, third paragraph. It is recommended that this section include a discussion that the physical and chemical processes affect different metals differently. A relevant point to make is that some metals are transported via dissolution and others via particle transport.

Response Text

Text added to section 4.1 clarifying that cadmium and zinc are observed in the dissolved phase, while lead has a higher fraction in the particulate phase in surface water in the Basin.

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Draft
Comments by Commenter
Kathy Johnson

Comment No.	Version	Subsection / Add'l Ref	Doc ID

*** No Watershed ***

7-Summary

1738 Draft — Doc ID 74

Comment Text

Page 4-8, Section 4 5. It would be helpful if this section discussed the impacts of levees, railroad beds, dikes, and channels. There are portions of the river system that have been largely altered by human activities. The impacts of past human activities need to be included in the RI. The FS will need to take into account future flood control needs and activities by communities. This will impact the way the natural systems function and where erosional and deposition zones are located.

Response Text

Details on stream alterations are too voluminous to include in this summary section but are contained in the watershed reports in the sediment transport sections.

Pine Creek

2-CSM Unit 1, Upper Watersheds

1741 Draft — Doc ID 77

Comment Text

In general the section does a good job of describing the effects the sources have on water quality; but does little to accurately pinpoint the sources. It identifies potential sources; but doesn't go the important next step. If it had, it would allow the FS to focus on 1) adit drainages at Nevada Stewart, Little Pittsburg, Sydney, Nabob, and Highland Surprise, 2) tailings piles at Upper and Lower Constitution, Highland Surprise, Nabob, and Hilarity, and 3) mixed tailings and alluvium. All else (e.g. waste rock) is insignificant.

Response Text

Time-critical removal actions conducted by the Bureau of Land Management (BLM) in 1996-1997 include removal of tailings from Amy-Matchless millsite, Liberal King millsite, and the Denver tailings. Additional actions have been proposed or are ongoing at the Amy-Matchless millsite, the Liberal King millsite, the Nabob millsite, the Denver Creek tailings, the Sidney millsite (on Red Cloud Creek), the Highland Surprise millsite, and the Upper Constitution millsite (BLM 1998).

Rehabilitation has been conducted or is ongoing at the major potential metals loading sources. Monitoring should be conducted to assess the effectiveness of the removal actions; therefore, no sites have been identified for detailed analysis/mapping in the FS at this time.

Bureau of Land Management (BLM). 1998. Information Sheet No. 3 Pine Creek Mill Sites. Executive Summary of the Final Engineering Evaluation/Cost Analysis Report. Shoshone County, Idaho. August 1998.

1742 Draft — 1 — Doc ID 78

Comment Text

Page1-2, para 1. Highland Creek was diverted in the 1999 field season rather than the east fork of Pine Creek.

Response Text

Text modified as per comment.

1743 Draft — 2 — Doc ID 79

Comment Text

Page 2-1, para 5. Besides the waste rock pile at the Sidney (Red Cloud), note the large waste rock pile also at the Sydney (Denver).

Page 2-4, para 2. There are probably still 45 patented claims. They represent the private property that BLM avoids cleaning up.

Page 2-4, para 3. More accurately, flotation allowed the recovery of zinc, which gravity methods could not.

Page 2-4, para 4. Not only was gravity separation inefficient, it recovered none of the zinc, which is the big concern with jig tailings in the environment.

Response Text

Text modified as per comment.

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Draft
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Kathy Johnson

Comment No.	Version	Subsection / Add'l Ref	Doc ID

Pine Creek

2-CSM Unit 1, Upper Watersheds

Page 2-9, para 4. The study was for Shoshone County not the City.

Page 2-10, para 3. Figure 2.3.2-1 shows the 1/74 event well but not the 2/96 event.

7-Summary

1744 Draft — **710**

Comment Text

Page 4-1. The chemical and mineralogical content of waste rock is not discussed in Section 4, which is no surprise because few if any dumps were characterized.

Response Text

Results of the sampling of waste rock for the identified ten COPCs are presented in this section. Geology is presented in Section 2 1. Results for numerous waste rock samples (soil and sediment) were included in this report. Specific source areas and associated types of samples collected are summarized in Table 4.1-1. Most of the data were originally reported in the Draft Removal Preliminary Assessment Report Pine Creek Millsites by Mackey and Yarbrough, 1995.

Spokane River

6-CSM Unit 5, Spokane River

1349 Draft — 1 — **226**

Comment Text — p. 1-1

second para, page 1-2, first para and page 5-1, third para. Reference is made to exceedance of dissolved lead and zinc at high flow. The data do not support the relationship between dissolved lead and zinc greater than the ambient water quality standard and high flow (Attachment 2). Also, please note that much of the dissolved lead data reported in the data summary are less than detection – these data should not be used to compare against water quality standards.

Response Text

In attachment 2, only detected results are compared to screening values. As the commentor noticed, dissolved lead reporting limits (1 ug/L) were not always low enough to catch detections just above the AWQC for dissolved lead (0.66 ug/L), However, as shown in Attachment 2 for segment 1 and segment 2, dissolved lead was reported as detected and exceeding AWQC in 12/25 (48%) and 18/36 (50%) of samples, respectively. Frequencies significant enough to warrant inclusion in the text. No text changes made.

1350 Draft — 1 — **227**

Comment Text — Figure 1.1-1

The map doesn't show the segment boundaries as described in the text nor are they labeled.

Response Text

Segments are labeled and the boundaries are shown by bold lines cutting across the River at the segment boundary. No changes made to the Figure.

1351 Draft — 3 — **228**

Comment Text — p. 3-3

para 1. "Upstream Dam" should likely be "Upriver Dam".

Response Text

Text corrected.

1352 Draft — 4 and 5 — **229**

Comment Text

Establishing screening levels for ambient water quality standards that are a function of hardness, cadmium, copper, lead, silver and zinc must be adjusted as the hardness in the Spokane River increases. As water from the Rathdrum Prairie-Spokane Aquifer enters the Spokane River the hardness increases. The groundwater aquifer water with a relatively high hardness (greater than 100 mg/l) contributes volumes significant enough to increase the hardness of the river. Since the metals standards increase with hardness, use of a screening level of 30 ug/L zinc throughout the Spokane River is a misapplication of the standards.

Response Text

As shown in Attachment 4 and described in Part 1 section 5, the screening levels used in the RI were selected from applicable risked-based "cleanup" concentrations and background concentrations. The screening value used for dissolved zinc in surface water is not based on the AWQC (43 at a hardness value of 30) but on the aquatic plant chronic benchmark (30 ug/L) described in the Ecolgical Risk Assessment. No text changes necessary.

Coeur d' Alene Basin - Remedial Investigation
Draft
Comments by Commenter
Kathy Johnson

Comment No.	Version	Subsection / Add'l Ref	Doc ID

Spokane River

6-CSM Unit 5, Spokane River

1353 Draft | 5 | **230**

Comment Text (p. 5-1)

fourth para. The reference to exceeding sediment screening levels in lake sediments in segment SpokaneRSeg03 is not supported by the data in Attachments 2 and 3. There are no sediment data reported for SpokaneRSeg03 and there are only 3 exceedances for subsurface soil data.

Response Text

Text corrected as per comment.

1354 Draft | 5.2 | **231**

Comment Text (p. 5-1)

The modeling exercise would be easier to understand if its usefulness were explained. For example, if an intended use is to make decisions about prioritization of remediation activities, that should be explained. In addition, the connection between dissolved and total lead must be further explained. Total lead is not exceeded in the Spokane River whereas dissolved lead occasionally exceeds ambient water quality standards.

Response Text

The probabilistic modeling is described in more detail in a Technical Memorandum (April 2001), the Feasibility Study (Part 3), and in Parts 1 and 2 (Canyon Creek) of the RI. For efficiency, detailed description of the model is not included in every watershed report. To clarify the reason why total lead and dissolved lead exceed screening criteria at very different frequencies, the total lead screening level is based on protection of human health (MCL is 15 ug/L) while the dissolved lead screening level is based on protection of aquatic life (AWQC at hardness of 30 is 0.66 ug/L). No text changes necessary.

1355 Draft | 5 | **232**

Comment Text (p. 5-4)

The report states that a metals TMDL is not available for the Spokane River in Washington. Washington DOE submitted a metals TMDL to EPA in 1999 and that TMDL was approved by EPA. It is the governing water quality document for metals in the Spokane River in the State of Washington. Irrespective of the TMDL for the Spokane River, the relevance of comparing the predicted metal loading to the TMDL for the Coeur d'Alene River at Harrison is not obvious. Since load is a function of discharge and concentration, comparisons between rivers are more appropriately done by comparison of concentration.

Response Text

TMDLs established for the Spokane River have been established for cadmium, lead and zinc are essentially the national ambient water quality criteria adjusted for site-specific hardness (Washington State Department of Ecology Pub. No. 98-329, September 1998). The TMDLs are not based on mass loading as they are for the Coeur d'Alene River. For the RI, Spokane River surface water concentrations are compared against NAWQC (adjusted for hardness values established for the three Spokane River watershed segments (01 to 03)). The comparison to the TMDL established for the CDAR at Harrison is included for illustration only.

1356 Draft | 5 | **233**

Comment Text (p. 5-11)

4th bullet. Caution must be used when describing the "major" source. For example, Figure 5.4-3 shows that the loading of total lead in the Spokane River increase more than 3-fold from the time it enters Washington (SR50) to the sampling location SR65 in the City of Spokane. These data suggests that the major source is within the Spokane Valley. The situation is similar for zinc. The mass loading of zinc nearly doubles from the time the River enters Washington (SR50) to the sampling location SR65 in the City of Spokane.

Response Text

Sources of metals in the Spokane River have not all been identified. The bullet removed.

Upper South Fork

2-CSM Unit 1, Upper Watersheds

1745 Draft | **711**

Comment Text

Page 2-19, Table 2.1.1. Include a statement that the Morning was purchased by Hecla in 1966.

Response Text

The Morning property was leased to Hecla in 1962 (Bull. 1999). Text and reference added.

Coeur d' Alene Basin - Remedial Investigation
Draft
Comments by Commenter
Kathy Johnson

Comment No.	Version	Subsection / Add'l Ref	Doc ID

Upper South Fork

2-CSM Unit 1, Upper Watersheds

1746 Draft — 4 — 712

Comment Text

Page 4.4, bullets. The 6 major ones are listed. Of these, the only ones where major work can be accomplished affect mixed tailings and alluvium in the South Fork, Golconda mine and mill, Morning 4,5,6 adit drainage, and Star 1200 and West Star.

Response Text

The feasibility of proposed remedial alternatives for these locations are presented in the FS.

1747 Draft — 713

Comment Text

Figures 4.2-1 and 4 2-2. There appears to be some inconsistency between the total lead loads at the sampling points and the calculated deltas between sampling points.

Response Text

Results were rounded to the nearest whole digit which could account for this observed inconsistency.

1748 Draft — 714

Comment Text

Table 4 1-1. The lack of information in this table plainly shows a lack of detailed knowledge about individual potential sources. It is hard to understand how a defensible preferred plan can be prepared with so little site characterization.

Response Text

Due to the large geographic area covered in this RI/FS, it was not practical to collect data for all areas of the basin. Additional site-specific data will need to be collected during design of any cleanup alternatives.

Coeur d' Alene Basin - Remedial Investigation
Draft
Comments by Commenter
Kathy Zanetti

Comment No.	Version	Subsection / Add'l Ref	Doc ID

Big Creek

2-CSM Unit 1, Upper Watersheds

2196 Draft — General — 152

Comment Text

In General: This report is so confusing, so purposely confusing, so filled with assumptions and admitted errors that for any party to release this report as is would be considered a fraud at best, and total contempt for the intended user at worst. Only the government would put out such nonsense and call it science. An example of their arrogance, Part 2, Section 2.0, page 2-8 - "Although these values reported might be dated and coefficients used to calculate these discharges may contain some error, they do provide some basis for selecting a design discharge for remedial actions."

Response Text

Comment noted.

2197 Draft — 2.0 — 153

Comment Text

In Section 2.0 page 2-2, we can find statements such as, "metal concentrations in soil may be elevated". Do they not know if the metal concentrations are elevated or not? Evidently they do not.

Response Text

Background metals concentrations in the upper basin are greater than in the lower basin. These differences are described in the final Background Technical Memorandum included as Appendix B to the Ecological Risk Assessment and included in the Administrative Record.

2198 Draft — 2.0 — 154

Comment Text

Section 2.0, page 2-5, is filled with confidence building statements. Such as, "The conceptual hydrogeologic model for the watershed assumes that a single unconfined aquifer is present". Very little specific hydrogeologic data are available for the Big Creek Watershed. Estimates on the number of adits and tunnels that are known to discharge mine drainage in this watershed are not available. Why not? On this same page we are told that, "There are 12 identified adits in the Big Creek watershed." So, we know how many adits someone says there are, but no one can tell us if any are discharging water? Interesting. On the same page, we are informed that, "It is assumed that ground water levels fluctuate seasonally." Why is this assumed? Just because, "observation in wells in the Canyon Creek and Ninemile Creek Watersheds" in unconsolidated sediments overlying bedrock. However, based on reported lithologic similarities between the presumed single unconfined aquifer and the upper aquifer of the Smelterville Flats-Bunker Hill aquifer system, it is reasonable to expect that aquifer parameters presented in table 2.2-1 are similar to the presumed single unconfined aquifer of the Big Creek Watershed."

This single paragraph is enough to render the whole report worthless.

We are expected to take this government mandated, government funded report seriously as the scientific bases for future work projects and future restrictions on what can and cannot be done in Big Creek. But wait, there is more foolishness to follow on this same page. We must, "assume that the general groundwater flow direction in the Big Creek Watershed parallels the flow of Big Creek surface water." Why are we asked to "assume" this, because of "similar watersheds" that are miles away. Then we must "assume that there are localized areas in Big Creek where flow directions is down stream…" Why must we "assume" this, because, of course, data from drainages miles away say so. Then we must "assume the ground water in Big Creek has a fairly steep gradient…" Why? Because of "information collected in Canyon Creek... it can be assumed the shallow alluvial deposits along Big Creek serve as aquifers..." ". it is further assumed that the interaction of the surface water in Big Creek and ground water in the shallow alluvial aquifers creates gaining or losing reaches."

To think people were paid money to write this study. Excuse me. Did I say study? I should have said trash.

Response Text

Due to large geographic area covered in this RI/FS, it was not practical to fully characterize all potential source areas. Because the upper watersheds share similar characteristics, general conclusions may be drawn from existing data and applied to watersheds with less information.

For this watershed in particular, a detailed characterization was not performed for the RI/FS because available data from the USGS, MFG, and IGS indicated that surface water metals concentrations and stream flow were low, having limited impact on the South Fork. No text changes made.

Coeur d' Alene Basin - Remedial Investigation
Draft
Comments by Commenter
Kathy Zanetti

Comment No.	Version	Subsection / Add'l Ref	Doc ID

Big Creek

2-CSM Unit 1, Upper Watersheds

2199 Draft 2.0 **155**

Comment Text

Page 2-7 is more of the same drivel. Since there are no water flow gages in Big Creek, they say it is O.K. to use... "Placer Creek data (9 miles East) compiled by the USGS who did water flow studies using flow gages".

We even have to guess - in the last paragraph - Where is the "City of Shoshone County, Idaho" "The U.S. Dept. of Housing and Urban Development, Federal insurance Administration completed a flood insurance study there." No such place exists. Yet we know this agency well. This is the agency that told congress a few months ago that they lost 58 Billion dollars. They did not know what happened to the money, it is just gone. So we can trust that the report that they did for the "City of Shoshone County, Idaho" is very accurate data and is very relevant to Big Creek. Good. They also went to all of the trouble to compute peak discharges for 100 year and 500 year floods. Good. I am sure this data will be very useful to the matter at hand.

Response Text

See response to Comment #2198.

Typo corrected.

2200 Draft 2.0 **156**

Comment Text

Now we have finally made it to page 2-8. This is where we learn that their data may be "dated and coefficients used to calculate these discharges may contain some error…"

Don't worry though, they just keep it up, they are back to using Placer Creek data for Big Creek flow data because Big Creek doesn't have any flow data. However my confidence defiantly started to improve when I read the following, "Agreement between the estimated discharge and measured discharge is relatively good; however 40 to 60 percent discrepancies should be expected." Not bad for government work, not bad at all. I wonder if the government would allow me "40 to 60 percent discrepancies" - in my work? How about if I tell them up front that it should be expected.

Still on the same page. They now say, "because historical discharge data is not available for Big Creek and the estimates of mean daily discharges are already subject to uncertainty, additional manipulation to obtain flood frequency was not completed." Even they had to admit their work is so bad it is useless. Thank you. But this bad and useless data did not stop them from including 4 pages of useless graphs.

This section 2 closes with pages of recorded mine and mill production. One would assume this information was obtained from the mine and mill records, and as such can be assumed as correct.

Response Text

See response to Comment #2198.

2201 Draft 3.0 **157**

Comment Text

No relief here. We are told right off that "sediment transport data are not available for areas within Big Creek." But this lack of information is not a big deal for the government good guys, no sir. Why? Because of good ole' Canyon Creek and Ninemile Creek are standing by. Even though here the study must resort to an all familiar disclaimer. Now - how is this? Because they offer this, "however, land use practices in the Big Creek watershed are substantially different than in Canyon and Ninemile Creeks." This would be a problem for anyone else, but not the government. so they continue.

They also want to us to know they did not actually leave the office to collect any information, because in the first paragraph they state that their data is "based on review of aerial photographs." This is good - very good. Far better than doing actual field work using actual Big Creek data - tar better for the report makers - hang the citizens that are expected to comply.

Response Text

See response to Comment #2198.

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Draft
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Big Creek

2-CSM Unit 1, Upper Watersheds

2202 Draft — 3.0 — **158**

Comment Text

On page 3-2, they want to make real sure we understood the previous page because the first sentence says, "Although land use in these watersheds is different (Canyon and Ninemile) than the land use in Big Creek these sediment yields were used to estimate sediment yield in Big Creek." Makes sense to me. Especially when a couple of sentences later they tell us that, "these estimates likely overestimate the amount of sediment transport because far fewer discrete sources exist in the Big Creek Watershed than in the Canyon and Ninemile Creek Watersheds." Why not. Go right ahead. They sure do.

Still on page 3-27, 3rd paragraph, "The level of information provided by a classification bases solely on topographic map and aerial photograph interpretation is limited…" Now why should we let a little thing like this bother us - it sure doesn't bother them.

Response Text

See response to Comment #2198.

2203 Draft — 3.0 — **159**

Comment Text

Let us skip a few pages and go to 3-5. The first paragraph tells us, "the only sources of sediment identified are from channel bed remobilization and minor bank erosion." What? No mine tailings? No toxic wastes? Of course this applies to Stations 167+00 to 250+00. There is still a chance for panic.

However segment (station 0+00 to 167+00) o4 "include channel bed remobilization, minor bank erosion and a few areas surrounding mine and quarry operations provided a surface water connection exists to Big Creek." Well, does one exist? How can they tell from topo maps and aerial photos sitting in an office?

Continue - station 47+00 to 110+00, "The only likely sediment sources in this reach are channel bed remobilization and minor bank erosion." Sounds like a potential superfund site here. Because from "station 110+00 to 167+00 there may be a sediment source." "No obvious surface water connection between the exposed soils surrounding the buildings (Sunshine Mine) was observed; however, if a connection exists, this may be a sediment source to Big Creek." "In absence of a surface water connection to Big Creek, the likely sediment sources in this reach are remobilization of channel bed and minor bank erosion." Before I get too far ahead I forgot to mention a quote about a source from the Crescent Mine. "A mine opening indicated by exposed rock from the Crescent Hooper tunnel is located approximately at station 110+00. No obvious surface water connection was observed in the photos." Thank God they never left the office on this one. Do I tell them to go look in person? Why confuse the report with eye witness facts?

Response Text

See response to Comment #2198.

2204 Draft — 3.0 — **1510**

Comment Text

Let's do this one more time - before we leave this section. Page 3-6. Repeat - station 210+00 to 220+00 (Gravel pit area). "If a surface water connection exists to Big Creek, this may be a sediment source. The likely sediment sources in this reach are remobilization of channel bed and minor bank erosion." I'm beginning to like those terms - remobilization of channel bed and minor bank erosion - has a rhythm to it - Good - very good words no doubt.

Cannot move on without quoting the last sentence of the Summary, "The estimate of sediment transport for water year 1999 is likely high because fewer discrete sources exist in Big Creek than in the watershed from which the estimate was made." More useless unrelated data. But we are suppose to let them use it. Let them change our lives because of it.

Response Text

See response to Comment #2198.

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Big Creek

2-CSM Unit 1, Upper Watersheds

Comment No.	Version	Subsection / Add'l Ref	Doc ID
2205	Draft	Table 3.2.1	1511

Comment Text

We can now leave this section with just a comment on table 3.2.1. Since we have been told the data is useless - why even bother to comment on a table with useless data?

Response Text

See response to Comment #2198.

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*** No Watershed ***

0-Comment Pertaining to Entire Document

2195 Draft 151

Comment Text

These comments about the DRAFT REMEDIAL INVESTIGATION REPORT FOR THE COEUR D'ALENE BASIN REMEDIAL INVESTIGATION/FEASIBILITY STUDY (RI) represent the opinions of the Shoshone Natural Resources Coalition (SNRC). We have attached specific unedited comments from our members as an addendum.

SNRC has asked its members and the local citizenry to comment about the RI for our use. The collaboration is from Shoshone County citizens, and we speak for a significant amount of the community. People who contributed to this effort were engineers, scientists, business men and women, academics, and "just plain folk" who live in the Silver Valley and raise their families there. We digested the over 8,500 pages of the document in what little time was available, while trying to make a living as well. For those very few people who have made an effort to read this document, there are another 100 (or 1,000) standing behind them cheering them on in the work they did. I hope you recognize this, and take our comments with the seriousness they deserve. We will start with general comments from SNRC as a group. This is followed by comments by individual citizens in the addendum. Please respond to all.

The RI document is fraught with gross assumptions, generalities, transpositions of what little data exists, admitted errors and poor science. One reviewer stated:

To reiterate, the situation specific to Canyon Creek does not differ from the general cases discussed in this review. The nature of the statistical distributions for metals concentrations is anomalous with respect to a log-normal distribution and subsequent interpretation of simple estimates of mean and standard deviation are likely to not be meaningful. Combined with significant uncertainties in the basis for background concentration estimation, the use of CSM probabilistic models in identifying contaminated sites on or along Canyon Creek is inherently unreliable.

Another states:

Section 2.0, page 2-5, (of the Big Creek Section) is filled with confidence building statements. Such as: "The conceptual hydrogeologic model for the watershed assumes (emphasis added) that a single unconfined aquifer is present ….." Very little specific hydrogeologic data are available for the Big Creek Watershed," "Estimates of the number of adits and tunnels that are known to discharge mine drainage in the watershed are not available." Why not? On this same page we are told that, "there are 12 identified adits in the Big Creek watershed." So, we know how many adits someone says there are, but no one can tell us if any are discharging water?

Another example of the inaccuracies of the study is as follows (with respect to the Big Creek watershed):

…they are back to using Placer Creek data for Big Creek flow data because Big Creek doesn't have any flow data. However my confidence defiantly started to improve (the writer is being sarcastic here) when I read the following: "Agreement between the estimated discharge and measured discharge is relatively good; however 40 to 60 percent discrepancies should be expected." I wonder if the government would allow me "40 to 60 percent discrepancies" - in my work? How about if I tell then up front that it should be expected?

One commenter made the following statement about the RI:

Response Text

Comment noted.

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If we compile the probabilities of the events/issues of the Remedial Investigation the resulting probability approaches zero. Therefore, why would any reasonable person invest huge sums of money in a procedure that will yield approximately the same as doing nothing? For example: Four sequential events each with a 60% probability of success. The final probability of success is 12.9%. Would a manager undertake a project with a 13% chance of success? I submit that the negative consequences may be greater then the positive.

SNRC uses these examples to point out that the RI is a hastily created document, using generic data and poor reasoning. The sheer number of assumptions and admitted errors make it impossible to allow the data to stand on its own merits. SNRC believes that there are areas in the Silver Valley that need attention with respect to cleanup. The RI does not address specific areas, but all of the drainage from the Montana to Washington boarders. It makes a case that all places in all drainages can possibly be contaminated if you play with the statistics enough.

We, as a concerned group of citizens in this community, cannot accept this approach, or the data in this investigation. We request that the study be abandoned, and that sites be identified using peered reviewed and statically justifiable data, and that these specific sites be dealt with on a case-by-case basis. SNRC respectfully requests a response to these statements.

Our impression of the RIFS procedure is that it will define the areas that need listing. Obviously, we are concerned that this generic document filled with admitted errors and gross assumptions will over-list. These procedures seem backwards to us. It seems that the areas need to be defined. and then the RIFS be completed on these areas. It is our impression that this document, based on its inadequacies alone, was created for another reason. Perhaps, in order to assist the NRD/Tribe/Mining companies lawsuit. One commenter makes a very good case for this theory, which is the first one attached. Is this the proper use of our government and tax dollars? Shouldn't the EPA be using its energy in systematically addressing sites that need cleanup, and leave the politics to others? SNRC respectfully requests a response to these statements and questions.

With this last issue in mind, it causes us to question our own efforts. If we ignore the document, then the EPA can state that we did not care. If we comment and participate. it could be construed that we have bought into the procedure and its conclusions. It seems as if we are damned if we do and damned if we don't. Therefore, we would like to make it perfectly clear, in the plainest words possible.

The community that lives in the upper Valley does not accept the RI or the FS (further comments to come). Therefore, we expect to be unable to accept the proposed plan.

In the addendum there are literally hundreds of comments. Some are made sarcastically. Please read and respond to each. You must understand that by now, with the tens of thousands of pages of documents that have been thrown at us over the last few years, that we are a little cynical. Cynicism, however, does not indicate misunderstanding. One cannot use cynicism to dismiss the very valid points made by our citizens.

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Pine Creek

2-CSM Unit 1, Upper Watersheds

2206 Draft — 4.4.2 — **1512**

Comment Text

My comments are specific to Pine Creek, but in many cases could be applied to other areas.

Response Text

Comment noted. Where applicable, responses provided to comments on Pine Creek have been incorporated into other watershed reports.

2207 Draft — 4.2.3.6.1 — **1513**

Comment Text

The HHRA was deliberately calculated to reflect conservative risk estimates.

Response Text

The HHRA followed established EPA guidance.

2208 Draft — 5.2.2 — **1514**

Comment Text

Background data is very poorly addressed. Estimates, assumptions, projections, and probabilities are rampant all through the report.

Response Text

The non-mining related sources of metals contribute to the background concentrations of metals observed in soil, sediment, and surface water. By using the background concentrations in conjunction with risk-based screening levels, locations with background concentrations of metals or less are screened out from further evaluation in the RI/FS process.

The probabilistic model is a predictive tool used to estimate the expected discharge and metal concentrations and loadings. No model can predict the discharge exactly, therefore it is estimated. The model is also used to estimate the probability that an observed discharge will not exceed a given value.

2209 Draft — 5.3.3 — **1515**

Comment Text

Concentrations are estimated expected values, not scientific findings.

Response Text

The probabilities are based on field data collected from 1991 to 1999. Calculations of the estimated expected values based on these field data used the latest scientific understanding of probability theory.

2210 Draft — 5.3.6 — **1516**

Comment Text

Can heavy metals be dissolved or are they all really suspended particulates?

Response Text

They can be dissolved. An individual atom or molecule will exist in solution surrounded by water molecules. The term "dissolved" as used in the RI is operationally defined and refers to the ability to pass through a 0.45 micron filter.

2211 Draft — 5.3.7 — **1517**

Comment Text

Pine creek significantly dilutes the South Fork at the entry point resulting in a decrease in suspended sediment per unit of discharge.

Response Text

There is no section 5.3.7 in the Pine Creek write-up so cannot determine text this comment is associated with; however, the relative contributions of metals to the South Fork from several major tributaries evaluated in this RI are discussed in Part 7.

2212 Draft — 5.3.5-8 — **1518**

Comment Text

The charts for sample data reporting metal concentrations appear to reflect large variances in the data. Statistical validity may be significantly skewed when old data with varied protocol, non-random targeted sampling, and modeling rather than true experiments

Response Text

Because of natural variability, as well as variability introduced from use of different analytical methods, there are large variances in the metal concentrations. As mentioned

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Pine Creek

2-CSM Unit 1, Upper Watersheds

are combined with sample data from the extremes. Again the big question is the validity of the science used.

in a previous response to comments, the model is based on actual field data. Using these field data a statistically valid "best estimate" was made of the expected discharge, metal concentrations, and loads.

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*** No Watershed ***

0-Comment Pertaining to Entire Document

1636 Draft — **41**

Comment Text

The Committee's technical review has identified numerous questions concerning whether the various RI/FS products have been developed based on the logic included in EPA Superfund guidance related to risk assessment, risk-based decision-making, acceptable uncertainties in decisions and the sufficiency of collected data. As addressed in the guidance, the basic purpose of the RI/FS process is to determine what areas are contaminated, what the risks are associated with those areas, what areas are acceptable and need no remediation and what receptors are at risk. We believe that the products to date do not reflect use of the agency's own guidance, and as a result, risk-based decisions have not been identified, the uncertainties of decision-making have not been identified, and an overly conservative approach has been used. At the very least, this could result in the wasting of resources. The Committee believes that deviation from the guidance and its inherent logic could drag the process on for years, tainting the region both aesthetically and economically.

Response Text

See General Response to Comments regarding DQO/DQA issues generated as part of the HHRA and the response to comments on the EcoRA.

1637 Draft — **42**

Comment Text

EXTENT OF CONTAMINATION

The question "Is my property subject to Superfund investigation?" is answered by knowing the extent of contamination. Defining the extent of contamination is an important Superfund objective that has not been determined in the Remedial Investigation (RI). This means that the individual backyards and property of the Committee and their constituents remain subject to Superfund investigation. This unknown has reduced marketability of their properties. This concern and potential to effect the growth and economy of the Basin is documented quite regularly, such as in the CDA Press October 29, 2000 "Basin's Image Tainted". Because the extent of contamination has not been identified, the entire Basin is in a state of confusion and uncertainty. The words "extent of contamination" are written many times in the RI Report, but the extent determined by the investigation is not defined in the Report. The National Contingency Plan (NCP) defines Remedial Investigation as:

"Remedial investigation (RI) is a process undertaken by the lead agency to determine the nature and extent of the problem [emphasis added] presented by the release. The RI emphasizes data collection and site characterization, and is generally performed concurrently and in an interactive fashion with the feasibility study. The RI includes sampling and monitoring, as necessary, and includes the gathering of sufficient information to determine the necessity for remedial action and to support the evaluation of remedial alternatives."

Unfortunately, the RI Report has not defined the extent of the problem presented by release of mining-related chemicals. This serious omission leaves the entire Basin open for additional investigation (continued Superfund stigma) and does not allow a defensible selection of remedial alternatives. Failure to define the extent essentially ensures that the investigation will be lengthy and will not be completed in a timely manner. Remedial alternatives and remediation cost estimates (required by EPA RI guidance) cannot be evaluated without knowing the full extent of contamination. Note that the existing reports do not define the criteria for full extent of contamination). It is critical to the economic development and growth of the Coeur d'Alene Basin that the full extent of contamination is quickly identified to eliminate areas from further investigation.

Response Text

The RI is considered a data report, presenting results for approximately 18,000 samples from numerous studies. For ease of use, concentration data were screened against risk-based concentrations, or available background concentrations, and mass loading results were screened against established TMDLs to give a first cut evaluation of source areas and media that warranted further review in the risk assessments and feasibility studies.

EPA believes that the more than 10,000 samples collected to support the RI/FS, combined with more than 7,000 samples collected independently by IDEQ, USGS, the mining companies, and EPA under other regulatory programs (e.g., NPDES), provide a solid basis to support informed risk management decisions for the Coeur d'Alene basin mining contamination.

Additionally, to help distribute results to the public before the RI/FS dcouments were published, draft results were made available in a user-friendly "ArcExplorer" mapping package. Lead and zinc data for soil/sediment, groundwater, and surface water were inlcuded.

1638 Draft — **43**

Comment Text

PUBLIC RECREATIONAL AREA EVALUATION

The Committee believes a responsible parent would not allow their young children to play on a public beach or common use areas, based on the EPA reports as submitted. EPA states that exposure to these areas results in unacceptable blood lead risk. This single perception has significant potential to reduce recreational use of the Basin and impact the growth and development of the Basin.

Response Text

Response to bullets 1 and 2: The RI is considered a data report, presenting results for 18,000 samples from numerous studies. For ease of use, concentration data were screened against risk-based concentrations, or available background concentrations, and mass loading results were screened against established TMDLs to give a first cut

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The average parent has little expertise evaluating EPA's assumptions and models and is not likely to question EPA's conclusion at face value. The Committee feels that EPA's report has caused needless concern about child lead exposure at beach areas. There are important omissions and errors in EPA's beach area evaluations.

1) The sampling strategy for beach areas was to test the hypothesis that the areas were acceptable, but this hypothesis was not tested. The acceptable uncertainty for testing the hypothesis that the beaches are clean is defined differently (DQO guidance) than testing the hypothesis that the beaches are dirty. The RI Report failed to test either hypothesis.

2) Superfund has straightforward guidance to determine whether areas should be further investigated or removed from investigation. This guidance was not used. This CERCLA guidance, which EPA has previously said is "optional", would likely have eliminated beach areas from further investigation and future investigation could have focussed on identified problem areas. [Soil Screening Guidance].

3) The model used to predict blood lead levels was inappropriate. EPA guidance on the blood lead model used states that intermittent exposure scenarios cannot be evaluated using the EPA blood lead model.

"This model uses standard age-weighted exposure parameters for consumption of food, drinking water, soil, and dust, and inhalation of air, matched with site-specific concentrations of lead in these media, to estimate exposure for the child. The model simulations represent chronic exposure and do not incorporate the variability in consumption patterns and media concentrations on a daily or seasonal basis."

We suspect that common use and beach areas are actually intermediate (daily or seasonal) exposure and not chronic as indicate, and as such, do not impose the degree of risk that EPA presents.

4) The exposure parameters identified in the risk assessment report were not used to estimate potential "annualized" lead intake. We suspect that the calculations may have incorrectly assumed children are at the beach two days each week of the year.

Although the Committee has submitted detailed comments concerning the risk estimates in these regards, the EPA continues to state that there is unacceptable child blood lead risk at beaches.

Response Text

evaluation of source areas and media that warranted further review in the risk assessments and feasibility studies.

Response to bullets 3 and 4: The HHRA disagrees with this comment. The IEUBK model is relevant for continuous exposures that are of sufficient duration to produce quasi-state blood lead concentrations. The incremental exposures evaluated by IEUBK analysis should not be characterized as episodic. The exposures evaluated are seasonal in nature, occurring over 6 to 8 month periods, with event frequencies of at least once per week.

The relationship between blood lead levels and environmental exposures is examined throughout the HHRA by a variety of methods. In regression analysis, it is common practice to compare dependent blood lead levels predicted from independent exposure variables to observed concentrations. In the IEUBK analysis, the same independent exposure variables are input to a mechanistic model and outcome blood lead levels are predicted. It is also common to compare these predictions to observed blood lead levels. Both the dependent and independent variables come from the same home and community and the objective of the analysis is to investigate and quantify any relationship between the variables. The regression analysis discussed above shows a relatively strong relationship, that is consistent with plausible environmental and biological processes, and is similar to the findings of investigations at other sites including the BHSS. As a result, it is appropriate to compare predicted and observed blood lead levels in both empirical and mechanistic procedures. The HHRA has been extensively reviewed by the EPA's Technical Review Workgroup (TRW) for Lead.

1639 Draft **44**

Comment Text

NON-CANCER RISK ESTIMATES

We believe that EPA is overly conservative (child only exposure) in its estimate of non-cancer risk. EPA's Science Advisory Board states that the approach taken is overly conservative and a combined child/adult scenario is sufficiently conservative for Superfund decisions. Defensible decision-making is not possible using child only scenarios. The RI Report should not have used this approach, and a the very least should have made it clear to the public that the approach used is even more conservative than EPA policy.

Response Text

We disagree with this comment. The White House issued a policy statement on April 27th, 1997 regarding health risks to children which states "It is the policy of the USEPA to consider the risks to infants and children consistently and explicitly as part of risk assessments...the Agency will develop a separate assessment of risks to infants and children...".

1640 Draft **45**

Comment Text

ECOLOGICAL RISK ASSESSMENT

The Committee believes that ecological risk estimates were incorrectly based on grab sample data (Table 4.2.2.1, Part 1 - RI Report). The majority of (soil/sediment) data used to estimate risk were grab samples. Risk assessment guidance is clear that grab sample data should not be averaged or used in risk assessment.

RAGS, page 4-18, "Although areas of concern are established purposively (e.g., with the intention of identifying contamination), the sampling locations within the areas of concern generally should not be sampled purposively if the data are to be used to provide

Response Text

Although Table 4.2.2-1 indicates grab sampling was conducted in a number of the FSPAs for the RI, FS, and risk assessments, it should be noted that many of the grab samples were not used for the EcoRA. Much of the data used for the EcoRA were collected under other sampling programs or studies, as described in the Final EcoRA (especially in Appendix A of that document). The selection of samples from among those collected under the FSPAs and DQOs pertinent to the EcoRA also are described

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defensible information for a risk assessment [emphasis added]. Purposively identified sampling locations are not discouraged if the objective is site characterization, conducting a chemical inventory, or the evaluation of visually obvious contamination. The sampling results, however, may overestimate or underestimate the true conditions at the site depending on the strategies of the sampling team. Due to the bias associated with the samples, data from purposively identified sampling locations generally should not be averaged, and distributions of these data generally should not be modeled and used to estimate other relevant statistics. After areas of concern have been established purposively, ground- water monitoring well locations, continuous air monitor locations, and soil sample locations should be determined randomly or systematically within the areas of concern."

Although beach areas, but not all common uses areas (lateral lakes), were sampled randomly or systematically, there are two important issues. The beach areas on Coeur d'Alene Lake have a significant amount of imported sand. In addition, ecological receptors specific to sampled beach areas are not identified. Human activities and modifications to the local environment prevent many evaluated receptors from being present at these locations. It is not clear how defensible risk-based decisions can be supported using grab sample data, when EPA guidance clearly states these data are not acceptable for this use.

DQO documentation of the decisions being made and the data necessary to support those decisions is clearly required to support ecological risk assessment. The DQO issue is discussed below.

in the Final EcoRA (Appendix A).

1641 Draft **46**

Comment Text

DATA QUALITY OBJECTIVES PROCESS

The Committee cannot identify the specific Superfund decisions that should be made in currently available draft reports and sampling plans. Step 2 of the recommended Data Quality Objectives (DQO) Process defines decisions to be supported by environmental data. This Step states the actions that could result from the resolution of each decision statement. Although this step and the other six steps are defined in several draft reports and sampling plans, performance of the steps does not seem to be carried out. Actual decisions, the relationship between the decisions and the supporting data, and potential actions cannot be located in the RI Report or available planning documents. EPA should have provided a list of specific decisions that are being made in the investigations. a list of data that supports each specific decision on the decision list.

Acceptable uncertainty in making decisions, which are not identified, also is not discussed. The acceptable uncertainty question should have been documented in the report as required in Step 6 of the DQO Process. Without following EPA guidance on this subject, EPA may never reach conclusion on the studies that would be necessary to achieve certainty.

The Committee believes that EPA should fully understand and use the DQO process methodology for completion of the RI/FS to enable a final plan that is conclusive and supports defensible decision-making.

Response Text

See General Response to Comments regarding DQO/DQA issues generated as part of the HHRA.

The human and ecological exposure routes identified in the CSMs and quantitatively evaluated in the reports had sufficient data to calculate risks.

In general, the data that were collected for use in the HHRA was of the same quality and quantity and at the specified confidence levels (either 95 or 99 percent) as that planned in the FSPAs. We note that FSPAs 6, 7, and 12 were residential samplings and sampled only on a volunteer basis. The HH risk assessment discusses the limitations of using volunteer data in the uncertainty section. However, for the lead risk assessment over 800 homes in the basin were sampled. Leading the human health risk assessment team to believe that this data set is sufficient to adequately evaluate risks. As discussed in the General Response to the DQO comments, the DQO process was considered and documented to varying degrees in each of the FSPAs in Part 1, Section 4.2.1 of the RI report. Therefore, for further discussion see the specific FSPAs and their alterations reports (RI Appendix J).

1642 Draft **47**

Comment Text

DATA QUALITY ASSESSMENT PROCESS

The Committee cannot confirm that the data used in the RI (and other draft reports) is of sufficient quality and quantity for defensible support of any decisions that must be made. This evaluation is particularly difficult because the decisions are not defined. We believe that EPA's Data Quality Assessment (DQA) Process should have been followed in development of the work so far. The DQA Process does not appear to be followed because it is not documented in EPA's Coeur d'Alene Basin Reports.

Response Text

Data usability was evaluated in the HHRA and EcoRA documents. While not explicitly noted in the text of the HHRA, the four data application issues from the 1992 guidance were met and are as follows:

1. What contamination is present at what levels? -- Adequately addressed in HHRA

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EPA guidance states the following concerning data quality assessment.
"DQA [Data Quality Assessment] is built on a fundamental premise: data quality, as a concept, is meaningful only when it relates to the intended use of the data. Data quality does not exist in a vacuum; one must know in what context a data set is to be used in order to establish a relevant yardstick for judging whether or not the data set is adequate. The Environmental Protection Agency (EPA) has developed the Data Quality Assessment (DQA) Process as an important tool for project managers and planners to determine whether the type, quantity, and quality of data needed to support Agency decisions has been achieved. Data Quality Assessment (DQA) is the scientific and statistical evaluation of data to determine if data obtained from environmental data operations are of the right type, quality, and quantity to support their intended use."
The DQA Process is particularly important in this RI, because data are used from many independent investigations by several state and federal agencies over several years time. Data were collected using sampling strategies that supported specific objectives and decisions that were not necessarily Superfund-type decisions. These data were combined to support decision-making, but the RI Report does not confirm that the data are appropriate to support Superfund decisions.
The RI Report simply documents that the laboratory quality assurance and quality control were acceptable and not that the data are of sufficient quality and quantity to support defensible decision-making. It appears (without documentation) that the data quality issue was performed in a vacuum, as identified in the above quoted guidance. The use of the data does not seem to be considered in the data quality assessment performed in the RI Report. The sampling strategies of the various data collection efforts and the limitations those sampling strategies impose on data use were not discussed.
We believe that the data used in the RI are subject to considerable question by the public when the data quality (based on use of data) is not discussed, which could lead to considerable objection to any remedial plan that is presented.

Section 2 which describes sample collection methods, data analysis procedures (metals), and notes where samples were collected specifically for human health needs versus other uses. The vast majority of the data used in the HHRA was collected based on human health considerations and fulfills the requirements of risk assessment guidance described in EPA's 1989 Risk Assessment Guidance for Superfund and in the 1992 document. For the relatively small amount of data used that was not collected for HHRA use (sediment and surface water data in the South Fork, Canyon Creek, and Ninemile Creek), the uncertainties surrounding this data are discussed in both HHRA Section 2 and in Section 7 of the report. Other than the data noted above and the special case of waste piles, all samples were collected using a randomized or systematic sample design appropriate for risk assessment evaluations.

2. Are site concentrations different from background? -- Adequately addressed in HHRA Section 2 which presented background concentrations for applicable media (except groundwater) and selected COPCs based on concentrations exceeding background levels and health levels. Aslo addressed in the EcoRA and the Background Technical Memorandum.

3. Are all exposure pathways identified and examined? -- Adequately addressed in HHRA Section 3 where exposure pathways were exhaustively discussed and conceptual site models by human health geographic area were presented.

4. Are all exposure areas fully characterized? Human health exposure areas were discussed in HHRA Section 3. However, they were not explicitly defined in many cases due to the large and complex area of the Basin. This lack will be addressed in documents addressing remediation which will select individual locations on an area-by-area basis.

1643 Draft **48**

Comment Text

MASS LOADING
The study has included considerable information about mass loading estimates which the Committee believes is not appropriate or useful. We cannot identify CERCLA RI/FS decisions (primarily type and extent or risk-related) that are supported by mass loading data. If EPA believes that mass loading rather than concentration data is germane, then decision criteria and data quality for the use of it should be clearly defined and reported in DQO sections of the study. For example, what is the decision criterion (a mass loading value) that identifies that a release has occurred from a suspected source? Information should be made available for each decision, boundary conditions, and the acceptable decision error for each decision supported by mass loading information
Surface water concentrations, not mass loading estimates, are used to estimate exposure point concentrations or potential risk (human health or ecological risk). Concentrations, not mass loading estimates, are used to identify releases to surface water from a source (classical upstream/down stream data collection). Mass loading values are dependent on the energy of the surface water ("fast flowing water" has high energy and higher suspended solids – and a resulting higher mass loading).Mass loading estimates introduce additional measurement error compared to using surface water concentrations. Two measurements are required for mass

Response Text

The RI was developed to help support the FS. Reduction of dissolved metal concentrations to meet AWQC (ambient water quality criteria) was the primary quantitative surface water performance goal driving development of the remedial alternatives in the FS. AWQC are the principal legal requirement, or ARAR, for surface water, and attainment of AWQC would generally provide protection of the aquatic environment, based on results of the ecological risk assessment.

TMDLs (total maximum daily loads) are used as the metric for compliance with AWQC. The TMDLs are the calculated maximum metal loadings that are consistent with attaining AWQC concentrations. These maximum loadings, termed "loading capacities" in EPA's TMDL documents, have been developed for dissolved zinc, cadmium, and lead, which are the three metals considered of greatest concern in the

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loading, concentration and flow rate. The additional measurement introduces additional error and increases the uncertainty of the result. Mass loading estimates are less certain than concentration measurements.
The decision whether a source is contributing unacceptable metal levels to a stream is complex using mass loading concepts. For example, two different streams may have upstream and down stream mass loading measurements of 100 and 200 pounds/day. Assume that stream 1 has a flow rate three times greater than stream 2. The concentrations of stream 1 (high flow rate) both up and down stream of the suspected source could be less than risk-based criteria at downstream and up-stream locations. Stream 2 (low flow rate) could have concentrations greater than risk-based criteria. This hypothetical example demonstrates that mass loading data are not useful to support risk-based decisions. Use of mass loading data could lead to erroneous conclusions.

basin.

Because AWQC determine TMDLs loading capacities, AWQC are met if loadings do not exceed TMDL loading capacities. It is expected that, for a given remedial alternative, AWQC would be met when the post-remediation loading meets TMDL loading capacities. Very simply, AWQC are met when TMDL loading capacities are met.

Using TMDLs as the metric for AWQC allows a tractable quantitative analysis of potential remedial performance. Details are presented in the Coeur d'Alene Basin FS and the RI/FS Technical Memorandum Probabilistic Analysis of Post-Remediation Metal Loading.

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	Big Creek			
2-CSM Unit 1, Upper Watersheds				
1453	Draft	2.1.3	**397**	
Comment Text		p. 2-2		**Response Text**
[Previous comment 2/41.] Referenced figure (Part 1 Fig. 3.2-1) does not show the features described (Big Ck and East Fork Anticlines). Suggest adding features to figure or removing reference to figure.				Reference to the figure has been removed
1454	Draft	2.1.6	**398**	
Comment Text		p. 2-3, 2-4		**Response Text**
[Previous comment 2/44.] The text should state that majority of production in Big Creek is from the Sunshine Mine, which has continued to produce metals since 1990.				The text has been modified to indicate 92% of Big Creek production through 1990 was from the Sunshine Mine.
1455	Draft	2.2.2	**399**	
Comment Text		p. 2-6		**Response Text**
[Previous comment 2/45.] The text refers to assumed analogous conditions in the Smelterville-Kellogg area by reference to Table 2.2-1. These data were derived from one sample in one well. The 1986-87 Bunker Hill RI/FS documented aquifer parameters from additional wells, including pump tests (MFG, 1987). Also, not sure about the similitude to the Smelterville Flats – Bunker Hill aquifer: gradient and geometry are steeper in Big Ck, which could affect aquifer parameters.				Data in the Golder EE/CA for the Success site was from shallow peizometers installed in "fill at the toe of the tailings/waste rock pile". Locations of and boring logs for these peizometers were not included in that report. Neither were vertical conductivity or transmissivity. For this RI/FS, slug tests were performed on three monitoring wells (NM441, NM442, and NM459) in Ninemile Creek Segment04. Wells were completed within bedrock at depths ranging from 30 to 45 feet. Material above the bedrock included fill, sands, clays, and gravels. Lithologic logs for these wells are included in Appendix B. Calculated hydraulic conductivities ranged from 90 to 120 feet/day, typical of silty sand and sand materials. Without site-specific groundwater information, selecting between the Smelterville aquifer information and the Ninemile Creek aquifer information as representative of conditions in this Creek is a toss up. No changes made to this section.
1456	Draft	2.1.6	**3100**	
Comment Text		p. 2-14		**Response Text**
Table 2 1.6-1 [Previous comment 2/47.] Although underground workings associated with the Alhambra Mine may project into the Big Creek watershed in the subsurface, the surface workings are located in West Fork Elk Creek (the next drainage west), and that is where the ore was extracted.				The reference to the Alhambra Mine has been deleted from the table, as the mine is correctly referenced in the South Fork watershed report (Table2.1.5-3)
1457	Draft	2.3.2	**3101**	
Comment Text		Fig. 2.3.2-2		**Response Text**
[Previous comment 2/49.] Figure is difficult to read, suggest selecting different colors or line types and thicknesses, and maybe plotting on 11"x17" paper.				Figure revised with new line weights.
1458	Draft	2.3.2	**3102**	
Comment Text		p. 2-19		**Response Text**
Table 2.3.2-2 [Previous comment 2/48.] Please show the typical values (= average for the entire period of record) of monthly precipitation and snowfall (by month) in the same table, to allow comparison with water year 1999.				Average monthly precipitation for period of record has been added.

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Big Creek				
2-CSM Unit 1, Upper Watersheds				
1459	Draft	3.2.1, 5.2	3103	
Comment Text		p. 3-1, 3-2, 3-23, 5-2		**Response Text**
Table 3.2-1 [Previous comments 2/52 and 2/63.] The comparison would be more useful if a range was projected for Big Ck, rather than using an average value. In addition, based on its characteristics (e.g., gradient, drainage area, soil types), is Big Ck more similar to Canyon Ck or to Ninemile Ck?				Comment noted. This table already contains information for Canyon, Ninemile, and Big Creek for comparison. No changes made.
1460	Draft	3.2.3.1 to 3.2.3.4	3104	
Comment Text		p. 3-4, 3-5		**Response Text**
[Previous comment 2/54.] Combined length of channel in all four segments does not add up to total length listed in section 2.3 (10 9 miles instead of 12.8).				Text modified in section 2.3.
1461	Draft	3.2	3105	
Comment Text		Fig. 3.2-4		**Response Text**
[Previous comment 2/57.] This figure doesn't accurately depict the channel of Big Creek near the tailings ponds. The creek is highly channelized in this area, flowing northeast along the easterly side of the upper pond, turning and flowing northwest between the two ponds, then turning and flowing northeast once again along the westerly side of the lower pond. The USGS quadrangle "Kellogg East" depicts the current trace of the channel.				Comment noted. Given the scale of the maps and the geographic size of the watershed, details requested are not practical to display.
1462	Draft	4.1	3106	
Comment Text		Fig. 4.1-1		**Response Text**
[Previous comment 2/60.] The legend incorrectly refers to the two samples collected as "tailings sampling location." No milling operations have been identified within this segment. The text (section 4 1.1 1) refers to two surface soil samples in this segment, which are presumably the locations indicated in Figure 4 1-1. Other figures in this section have similar notations.				As noted in the response to comments on the Preliminary Draft, these samples were collected by the Idaho Geological Survey. This reference was checked and the location type of tailings was confirmed. No text changes necessary.
Beaver Creek				
2-CSM Unit 1, Upper Watersheds				
1442	Draft	2.1.5	386	
Comment Text		p. 2-3		**Response Text**
[Previous comment 2/12.] 1st para: A figure situated in this section, showing all the named sites, would be helpful.				Text modified to delete mining information and incorrect references to figures.
1443	Draft	2.1.6	387	
Comment Text		p. 2-3, 2-4		**Response Text**
[Previous comment 2/14.] No discussion of hydraulic mining and floating dredge operations in the Trail Creek confluence area; tailings dams should also be mentioned.				Source area information is presented as reported by the BLM and specific mining records as summarized in this section. Though hydraulic mining occurred in areas of the North Fork (see Quivik Expert Report excerpt below), details on specific locations of hydraulic mining as requested by the commentor are not available. According to the Expert Report from Frederic Quivik, Ph.D.: "Mining activity in the North Fork took place along tributaries like Prichard Creek, Eagle Creek, and Beaver Creek, located primarily in the southern portions of the watershed, adjacent to and directly over the divide from the South Fork. The processing of minerals in the North Fork can be

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Beaver Creek

2-CSM Unit 1, Upper Watersheds

divided into three
categories: 1) stamp milling, which largely took place during the first twenty years of mining in the district and which was aimed almost exclusively on recovering gold; 2) hydraulic mining,
which mainly took place during the first forty years of mining in the district and which was also aimed almost exclusively on recovering gold; and 3) concentration, which used several stages of mineral processing to separate minerals bearing precious, base, and/or rare metals from the host rock. Although these three kinds of metallurgical activity, in aggregate, did dislodge vast amounts of solid material from its native setting and discharge that material into the hydraulic system of the North Fork and therefore the Coeur d'Alene River system as a whole, the mining activities on the North Fork contributed relatively little to the accumulations of contaminants below the confluence with the South Fork."(p. 161)

"During the late nineteenth century, several groups of miners used hydraulic methods to mine the North Fork country for gold. The operations used water under pressure, sprayed
through giant nozzles, to erode large volumes of sand and gravel and wash the material through sluice boxes to recover gold. In the early twentieth century, other companies began dredging
stretches of Prichard Creek, Eagle Creek, and other streams in the vicinity of Delta. The Coeur d'Alene Mining Company consolidated many of the placer claims around Delta in 1900 and
shortly thereafter.

Although these various forms of placer mining dislodged tremendous volumes of alluvial material along the banks and beds of the streams tributary to the North Fork, the operations did
not change the size or the chemistry of the material. They simply washed it through sluices and other devices designed to recovery gold resident in the sands and gravels." (p. 163)

1444 Draft | 2.1.6.2 | **388**

Comment Text | p. 2-5

[Previous comment 2/16.] No mention of the Jenkins Prospect and Kenan Group adjacent millsites listed in the source area in section 4. A caveat was placed in the text that not "not all mills are listed, as records were not available for all mills," but a simple mention of the known mills by name would allow the reader to form a better understanding of the conditions.

Response Text

Text modified to reflect comment.

1445 Draft | 2.2.1, 2.3, 5.3 | **389**

Comment Text | p. 2-5, 2-7, 5-2

[Previous comment 2/19.] In 2.3 and 5 3, drainage area is given as 44 1 sq. mi. and channel length as 12 miles, while in Section

Response Text

Text modified for section consistency.

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Beaver Creek

2-CSM Unit 1, Upper Watersheds

2.2.1 drainage area is cited as 37 sq. mi. and channel length as 10 miles.

1446 Draft — 2.2.2 — **390**

Comment Text — p. 2-6

[Previous comment 2/18.] The text refers to assumed analogous conditions in the Smelterville-Kellogg area by reference to Table 2.2-1. These data were derived from one sample in one well. The 1986-87 Bunker Hill RI/FS documented aquifer parameters from additional wells, including pump tests (MFG, 1987). Also, not sure about the similitude to the Smelterville Flats – Bunker Hill aquifer: gradient and geometry are very much steeper in Beaver Ck, which could affect aquifer parameters. Can information from the Success Site in Ninemile Creek (Golder 2000) be used for vertical conductivity and for transmissivity?

Response Text

Data in the Golder EE/CA for the Success site was from shallow peizometers installed in "fill at the toe of the tailings/waste rock pile". Locations of and boring logs for these peizometers were not included in that report. Neither were vertical conductivity or transmissivity.

For this RI/FS, slug tests were performed on three monitoring wells (NM441, NM442, and NM459) in Ninemile Creek Segment04. Wells were completed within bedrock at depths ranging from 30 to 45 feet. Material above the bedrock included fill, sands, clays, and gravels. Lithologic logs for these wells are included in Appendix B. Calculated hydraulic conductivities ranged from 90 to 120 feet/day, typical of silty sand and sand materials.

Without site-specific groundwater information, selecting between the Smelterville aquifer information and the Ninemile Creek aquifer information as representative of conditions in this Creek is a toss up. No changes made to this section.

1447 Draft — 2.3.1 — **391**

Comment Text — p. 2-7

Table 2.3.1-1 [Previous comment 2/20.] 1st para and table: Show stations on a figure, or refer to Figure 4.1-2. Also, in Table 2.3.1-1, indicate the streams on which these stations are situated.

Response Text

Text has been modified. Locations of these sampling locations are clearly shown in Figure 4.1-2. Stream names not added to Table 2.3.1-1.

1448 Draft — 2.3.1 — **392**

Comment Text — p. 2-7

[Previous comment 2/21.] 2nd para, last sentence: Indicate whether these values are likely to be overestimates or underestimates. In addition, FIA values cited are entirely duplicating Table 2.3 2-1.

Response Text

It is unknown if these values likely under- or over-estimate discharge events. Table reference added to the paragraph discussing FIA data in Section 2 3.1 and the Table number undated to 2.3.1-2 from 2.3 2-1.

1449 Draft — 2.3.2.2 — **393**

Comment Text — p. 2-8

[Previous comment 2/22.] 3rd para, last sentence: Should probably read "Rain on snow also may have contributed to these increases…"

Response Text

Text has been modified.

1450 Draft — 3.2.1 — **394**

Comment Text — p. 3-2

[Previous comment 2/24.] 3rd para: This is the first mention of the tailings dams. These should be discussed in section 2.

Response Text

Comment noted. These are features associated with known source areas shown in Figures 4.1-1 and 4.1-2. Historical information about these tailings ponds was not found in our literature search. Soil and surface water samples were collected from this source area for the RI. Results are included in Section 4 and Attachment 2.

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Beaver Creek				
2-CSM Unit 1, Upper Watersheds				
1451	Draft	4.1	395	
Comment Text		p. 4-1 to 4-3, 4-7		**Response Text**
Table 4 1-1 [Previous comment 2/25.] Entire section and table: Match info in this section with section 2.1; the two are currently ignoring or even contradicting one another.				Table 2 1-1 contains a summary of available historical information on mine production while Table 4.1-1 is a comprehensive list of source areas (originally from the BLM, modified during the RI/FS process. No contradicting information found. No text revisions made.
1452	Draft	5.3	396	
Comment Text		p. 5-2		**Response Text**
[Previous comment 2/29.] 2nd para: Drainage area and channel length have already been cited in sections 2.2.1 and 2 3. This agrees with 2.3 but not with 2.2 1. Suggest deleting.				Text in Section 2.2-1 revised to match other sections.
Canyon Creek				
2-CSM Unit 1, Upper Watersheds				
1380	Draft	2.1	324	
Comment Text		p. 2-1		**Response Text**
1st paragraph: The document correctly refers to the complex at Burke as the Hecla-Star Complex, but the tailings ponds at Woodland Park are related to the Star-Morning Mine, not the Hecla Mine, and are typically referred to as the Star-Morning Tailings Ponds.				For consistency with the BLM source area list and all GIS figures, the name has not been changed.
1381	Draft	2.1.1	325	
Comment Text		p. 2-1		**Response Text**
[Previous comment 2/95.] Note that the headwaters of Canyon Creek are also at the Bitterroot Divide, which separates the Clark Fork Basin from the Coeur d'Alene Basin.				The text has been modified.
1382	Draft	2.1.5	326	
Comment Text		p. 2-3		**Response Text**
[Previous comment 2/97.] 1st paragraph: The "Morning-Star Mine" is more often referred to as the Star-Morning Mine.				For consistency with the BLM source area list and all GIS figures, the name has not been changed.
1383	Draft	2.1.6	327	
Comment Text		p. 2-4, 2-5		**Response Text**
[Previous comment 2/108.] 2nd paragraph: It should be acknowledged that two railroad lines were constructed along Canyon Creek during the late 1880s and early 1890s (Wood 1983). The current-day road is situated over one of these railroad embankments, while the other is still visible along the side of the canyon above the road. It is highly likely that these railroad embankments were constructed using mine waste as ballast.				Yes but this section is not presenting a discussion on railroad ballast but addresses mining history. No text changes made.
1384	Draft	2.1.7.5	328	
Comment Text		p. 2-6		**Response Text**
2nd paragraph, 1st line: "The tailings ponds for the Hecla-Star Mine are located…": The tailings ponds received tailings from the Star Mine (which was also operated from 1983 to 1990 as the "Star-Phoenix Mine" by a lessee) (SAIC 1993b). They did not receive tailings from the Hecla Mine (although some have probably deposited in the contaminated floodplain upon which the ponds are built).				For consistency with Source area maps and tables within both the RI and FS, the name has not been changed.

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1385	Draft	2.1.7.5	**329**	
Comment Text		p. 2-6		**Response Text**
[Previous comment 2/109.] 2nd paragraph, 4th line: "The five upper ponds are inactive and have sparse vegetation." Note that that significant erosion can be observed along the sides of the ponds. Areas of seepage have been identified and sampled over the years, yielding total recoverable lead concentrations in the 1,000 to 2,000 ug/L range, and total recoverable zinc concentrations in the 30,000 to 35,000 ug/L range (MFG 1991; Houck and Mink 1994; Liverman 1995; Gearheart et al. 1999).				Text modified to reflect comment.
1386	Draft	2.2	**330**	
Comment Text		p. 2-7		**Response Text**
[Previous comment 2/100.] 3rd paragraph: The alluvium does increase in thickness in segment 5, but near the mouth of Canyon Creek the alluvium both narrows and thins as the canyon narrows and bedrock is closer to the surface (as discussed in 2.2.3.3 para 4). This thinning is still not clear in the revised text.				Text modified to reflect comment.
1387	Draft	2.3.1	**331**	
Comment Text		p. 2-15		**Response Text**
[Previous comment 2/112.] 3rd paragraph and Table 2.3-1, pp. 2-50 and 2-51: The table would be more useful and would match the discussion in this paragraph better if the expected flow values for these dates, as obtained through the "historical" hydrographs developed from the Placer Ck data, were listed for comparison.				Table 2 3.1 summarizes stream discharge measurements made by various organizations at various locations over time. Comparison to specific discharge estimates is not feasible in this format.
1388	Draft	2.3.1	**332**	
Comment Text		p. 2-15		**Response Text**
[Previous comment 2/113.] 4th (last) paragraph: Should the FIA information be directly compared to the information presented in Table 2.3-2? Coordinate description and compare with discussion in paragraph 2.3.2.2.				For comparison, the FIA study results have been added to Table 2.3-2 and discussed in Section 2 3.2.2.
1389	Draft	3.2.1	**333**	
Comment Text		p. 3-2, 3-3, 3-14		**Response Text**
Figure 3.2-1[Previous comment 2/116.] Regressions of this kind, where there is a good deal of scatter around the regression line, might be more useful if the confidence interval was plotted around the regression line, and the actual confidence level (e.g., 90%, 95%) was indicated.				These results are reproduced directly from the USGS study. This report should be reviewed for a more complete discussion of uncertainty associated with the data.
1390	Draft	3.2.1	**334**	
Comment Text		p. 3-3, 3-39		**Response Text**
Table 3 2-1 [Previous comment 2/117.] 1st paragraph: values like "1,358 tons" per year for the watershed give an illusion of precision. The value would be more useful if it was presented as a range for a specified confidence level.				Text and Table 3.2-1 have been changed to include only two significant figures.
1391	Draft	3.2.1	**335**	
Comment Text		p. 3-3		**Response Text**
[Previous comment 2/118.] 2nd paragraph: This has already been mentioned in section 2.3.1, and is cogent to the discussion in 2.3.2.2.				The range of mean monthly discharge values is less than 200 cfs (Table 2.3-3), much less than is possible during flood events as illustrated by including the FIA results here. The FIA study results are referred to in this paragraph to help the reader keep perspective when reviewing figures in sections 2.3 and 3.2.
1392	Draft	3.2.3.5	**336**	
Comment Text		p. 3-11, 3-12		**Response Text**
[Previous comment 2/120.] There are several casual mentions in this section of the SVNRT rehabilitation actions, but no				Text has been modified in Section 3.2.3.5. Please also refer to Section 1.0 of this report

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description of these actions in the preceding sections. Such a description would help comprehension. We suggest briefly summing up the information presented in Part 1, since the volumes are likely to be used separately.				for more details on cleanup actions that have occurred in Canyon Creek.
1393	Draft	3.2	337	
Comment Text		Figs. 3.2-6 to 3.2-8		**Response Text**
[Previous comment 2/102.] These figures are not entirely legible in blank and white.				Figures have been modified.
1394	Draft	3.2	338	
Comment Text		Figs. 3.2-15 to 3.2-19		**Response Text**
[Previous comment 2/103.] These figures have several inaccuracies in terms of names and locations of features such as mines, tailings ponds, etc.				Source area names on these figures removed.
1395	Draft	4.1.2.6	339	
Comment Text		p. 4-4		**Response Text**
2nd paragraph: Indicate location where metals were found at concentrations greater than10x the screening level: surface soil at CC1252 along creek immediately downstream of Canyon Creek Garbage Dump (Pb 10x), and subsurface soil at CC402 along stream below Ajax No. 3 adit and rock dump (Pb and Zn 10x).				Detailed sample results are presented in tables to minimize the length of text needed if sample-specific data are discussed. Samples collected from within source areas and presented in section 4 1 tables were identified using GIS. If the location was within a BLM polygon, it shows up in these tables. Not all samples were collected from within source areas according to this definition; therefore not all results will be presented in these tables. This method was used to facilitate the screening of more than 16,000 sample results. Reviewing all results and presenting detailed discussions was beyond the scope of this report.
1396	Draft	4.1.4.5	340	
Comment Text		p. 4-6		**Response Text**
2nd sentence, 2nd line: Suggest rewording: Analysis of total metals indicates at least one sample each with concentrations of cadmium, iron, lead and manganese greater than 10x the screening levels.				Text modified as per comment.
1397	Draft	4.1.4.6	341	
Comment Text		p. 4-6		**Response Text**
2nd paragraph, 3rd sentence, 3rd (last) line: Suggest rewording: "Additional source areas showed concentrations of antimony, arsenic, cadmium, copper, lead, and zinc greater than 10x the screening level."				Text modified as per comment.
1398	Draft	4.1.4.7 and 4.1.5.7	342	
Comment Text		p. 4-6 and 4-9		**Response Text**
1st paragraph: "The technical memorandum identified discrete mine/mill sites and tailings impoundments. Additional floodplain reaches were added later." Which technical memorandum is that? The previous sentence only referred to Appendix G, in which we could not find a list of major source areas.				The Tech Memo reference is correct (Draft TM No. 1, "Candidate Alternatives and Typical Conceptual Designs". The source areas identified for further evaluation in the FS are listed in the text of Appendix G. The source area list was further refined during the RI/FS process after publication of this Tech Memo. Text modified to include this further analysis.
1399	Draft	4.1.4.7 and 4.1.5.7	343	
Comment Text		p. 4-7, 4-9, 4-10		**Response Text**
(Discussion of surficial geology units from Box et al. 1999): Box et al. (1999) was used as a basis to estimate areas and volumes of contaminated floodplain materials. Since these results are not presented in the current version of the RI, the mention of this work				Text modified to include reference for volume estimates in the FS (Appendix D, Section 2.0) and more clearly present why these geology units are included here.

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and the various units included is merely confusing for the reader. We recommend presenting in Part 1 a summary of the work done, then summarizing the results (areas and volumes) in the individual sections of CSMs 1 and 2 (Parts 2 and 3).				
1400	Draft	4.1.5.2	344	
Comment Text		p. 4-8		**Response Text**
2nd sentence: Suggest rewording: "Cadmium, lead and zinc were detected at concentrations in the subsurface soil that exceeded 10x the screening levels at several locations."				Text modified as per comment.
1401	Draft	4.2.1.2	345	
Comment Text		p. 4-13		**Response Text**
Last paragraph, 1st sentence: Suggest adding: "These results support using dissolved zinc as an indicator for dissolved chemical concentrations and total lead as an indicator for total chemical concentrations in the upper and midgradient watersheds (CSMs 1 and 2)."				Text modified as per comment.
1402	Draft	4.2.2.1	346	
Comment Text		p. 4-15		**Response Text**
Item #4, 2nd paragraph, 4th sentence, 4th line: Specify: "The Star-Morning Tailings Ponds and the SVNRT tailings repository are the dominant mining features in the floodplain."				Text modified as per comment.
1403	Draft	4.2.2.2	347	
Comment Text		P. 4-16		**Response Text**
Item #2, 1st paragraph "This increase in loading may reflect exceedance of an erosion threshold such as those discussed in McBain and Trush (2000)." Such a threshold is expected to have a more noticeable effect on total lead loadings than on dissolved zinc loadings. Was this observed for corresponding high flow events?				Only one suspended sediment and bedload sediment transport study has been conducted in Canyon Creek (USGS 2000b), therefore, these threshold values cannot be confirmed.
1404	Draft	4.2.2.3	348	
Comment Text		p. 4-17		**Response Text**
1st paragraph: This paragraph seems disconnected from the subsequent ones. Also, describe where the discharge from ground water to surface water occurs in the Woodland Park area.				Text added to the first paragraph to clarify the USGS seepage study included sampling from nine locations in the Woodland Park area. See Barton 2000 for a detailed analysis. Text added to last paragraph in this section stating that the last reach in CCSeg05 is a gaining reach as bedrock becomes shallow and groundwater is release from the alluvial aquifer.
1405	Draft	4.2.2.3	349	
Comment Text		p. 4-17		**Response Text**
1st paragraph, 2nd sentence: The document referred to as "USGS 2000" here is called as "Barton 2000" elsewhere in the document. Suggest changing reference to "Barton 2000" here.				Text modified as per comment.
1406	Draft	4.1	350	
Comment Text		Figs. 4.1-23, 4.1-24		**Response Text**
[Previous comment 2/121.] At this scale, it would be more useful to use gray shading or contour outlines than a small star marker to show city locations.				This is our standard format. No change necessary.
1407	Draft	4.1	351	
Comment Text		Fig. 4.1-26		**Response Text**
This does not appear to be a photo of the Tamarack No. 7 waste rock pile. If it is, it is looking northeast, not southwest.				Title of photo revised to show this is a mine waste rock area.

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1408	Draft	4.1	352	
Comment Text		Fig. 4.1-31		**Response Text**
This photo does not show any tailings piles				Photo removed.
1409	Draft	4.1	353	
Comment Text		Fig. 4.1-33, 34		**Response Text**
These photos do show the Star-Morning Tailings Ponds (not the Hecla-Star), but do not show the Hecla-Star Complex/Tiger Poorman/Hidden Treasure, which is in Burke				Figure title revised.
1410	Draft	4.1	354	
Comment Text		Fig. 4.1-38		**Response Text**
This photo appears to be inverted; the outcrop at right center is the same as shown in Fig. 4 1-32. The view is upstream of the Gem, looking downstream near the Frisco and CC281.				Figure deleted.
1411	Draft	4.1	355	
Comment Text		Fig. 4.1-39		**Response Text**
The only Silver Dollar adit that we are aware of is located near the mouth of Rosebud Gulch in the Osburn area.				Figure Deleted.
1412	Draft	5.1	356	
Comment Text		p. 5-1, 5-2		**Response Text**
Neither Segment CCSeg02 nor Segment CCSeg03 are thought to "contribute [metal loads] significantly to Canyon Creek", and yet "approximately 30 pounds [per day] of dissolved zinc have been measured entering Segment CCSeg04 under high-flow conditions." Since CCSeg02 and CCSeg03 are the only two segments directly upstream of CCSeg04, whatever enters CCSeg04 should be exiting from one (or both) of the other two, unless the input here is attributed to ground water inflow. This should be clarified.				Text corrected as per comment.
1413	Draft	5.1	357	
Comment Text		p. 5-2		**Response Text**
3rd paragraph, 2nd line: "the Hecla-Star tailings piles": these are referred to as "tailings ponds" in the rest of the document. Additionally, here and elsewhere, the ponds should be referred to as the Star-Morning Tailings Ponds.				Piles changed to ponds. The source area names used in this document are those reported by the BLM GIS coverage. No change necessary.
1414	Draft	5.3, 5.4	358	
Comment Text				**Response Text**
These two sections (5.3 Fate and Transport Mechanisms, and 5.4 Fate and Transport Model) seem practically unrelated. Although the discussion of mechanisms is fairly detailed and technical, the model is entirely empirical, i e , not based on a mechanistic approach. We agree that the state of current information on the system makes an empirical approach appropriate, but it would be useful to have at least some connection between the two sections of text. In particular, the practical implications of section 5.3 seem to relate to the FS (e.g., discussion of pH range for adsorption, saturation level) but not to the rest of the RI. The only tie-in we found was far down, at the end of subsection 5.5.2.4 on page 5-23.				Section 5.3 presents general information on chemical and physical mechanisms that affect fate and transport of metals. It is beyond the scope of this analysis to measure and do detailed analysis on each of these mechanisms; therefore, the probabilistic model was developed and applied. The model integrates affects of all of these mechanisms.
1415	Draft	5.4.2.1	359	
Comment Text		p. 5-12		**Response Text**
4th full paragraph: "The restriction to positive values and a skewing of higher values in the tail of the distributions are characteristic of lognormal distributions."				Text modified as per comment.

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1416	Draft	5.5.2	**360**	
Comment Text		p. 5-18		**Response Text**
4th paragraph, 3rd and 4th sentences: These sentences (scaling of TMDL values) seem to apply to Figure 5.5-5 rather than Figure 5.5-4 as is indicated in the text. It seems they should be moved to the end of para #6 of the same page, where Figure 5.5-5 is introduced.				Reference to Figure 5 5-4 removed for clarity.
1417	Draft	5.5.2.1 to 3, 5.5.3.1 to 3, 5.5.4.1 to 3	**361**	
Comment Text		p. 5-19 to 22, 25 to 28, 29 to 32		**Response Text**
Until now, segments have been referred to by their CSM designation (CCSeg01 through CCSeg05); in these sections they are referred to as Segments 1 through 5. We suggest systematically using the CSM segments designations for consistency.				Text modified as per comment.
1418	Draft	5.5.2.3, 5.5.3.3, 5.5.4.3	**362**	
Comment Text		p. 5-21, 5-27, 5-31		**Response Text**
p. 5-21, 2nd paragraph, 9th line; p. 5-27, 1st paragraph, 8th line; and p. 5-31, 1st paragraph, 8th line: "The expected or predicted loss in discharge in this reach is approximately B13 cfs (Table 5 5-2)." It seems that this should read "…is approximately 13 cfs…", based on the value in the referenced table (loss of 13 cfs, or delta of –13).				Text modified as per comment.
1419	Draft	5.5	**363**	
Comment Text		p. 5-33		**Response Text**
It would be useful to sum the results, e.g., whether load gains and losses all happen within the same reaches for all three metals, the similar behavior and partition of cadmium and zinc, etc.				Summary information added to section 5.7 and new Table 5.7-1 added.
1420	Draft	5.5	**364**	
Comment Text		p. 5-52, 5-53		**Response Text**
Fig. 5.5-7, -8 Should the legend be understood to indicate R-square values of 0.097 and 0.021, respectively, for the two regression lines?				Because limited data (1991 to 1999) are available to evaluated changes in discharge and concentrations over time, and the R-squared values were very low, time-trend analyses have been removed from the RI.
1421	Draft	6.0	**365**	
Comment Text		p. 6-7		**Response Text**
Reference "URS 2000", 2nd line: Correct "Coeur d'Alene River Basin Feasibility Study."				Text modified to reflect comment.
1422	Draft	4.1, 4.7, 4.1.5.7	**366**	
Comment Text		p. 4-6, 4-9, 5-86		**Response Text**
Table 5.7-1 The lists of "major source areas" in Section 4 and the list of "potential major source areas" in Table 5.7-1 need to be coordinated. We recommend moving Table 5.7-1 to Section 4 and editing it to reflect the information presented in this chapter.				Table 5.7-1 edited to match section 4.1 lists of major source areas and the source areas identified in the FS.
1423	Draft	4.1, 5.7	**367**	
Comment Text				**Response Text**
Tables 4 1-1 through 4.1-5, Table 5.7-1 These tables do not offer the information that would be needed in the FS, in particular quantity estimates, volumes, depths, and other information on the extent of the primary identified sources.				To limit redundancy between the RI and FS and reduce the overall length of the documents, volume estimates are only included in the FS. No text changes necessary.
1424	Draft	4.1	**368**	
Comment Text				**Response Text**
Tables 4.1-1 through 4.1-5 These tables are based solely on the inventory prepared by BLM. While it is an excellent source of				The BLM GIS coverage was selected as the base for identifying source areas in the RI.

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information and a good choice for the core inventory, other sources need to be added. In particular, the surficial geology analysis prepared by Box et al. (1999) does not entirely coincide with the BLM inventory, but is a very important source of information. New polygons should be created and added to those of the BLM source inventory.				Further refinement of the floodplain source area boundaries are included in the FS and will be an ongoing task as areas are identified for action and more data are gathered. No modifications necessary.
1425	Draft	5.7	369	
Comment Text		p. 5-86		**Response Text**
No justifications are offered to support the choice of these sites. As it is, we assume that these sites are selected solely on the basis of being situated in a load increase reach. The reason for their selection should be stated, and an overall explanation of the selection process should be added to the main text. The following comments address individual entries.				Table 5.7-1 edited to match section 4.1 lists of major source areas and the source areas identified in the FS.Text added to present selection criteria.
1426	Draft	5.7	370	
Comment Text		p. 5-86		**Response Text**
Table 5.7-1 Gertie Mine: This mine was not a producer. The Gertie Tunnel has medium flow, and low metal concentrations; only one surface soil sample was taken, but did not exceed 10x the screening levels.				Table modified to reflect the major source area list presented in section 4.1.
1427	Draft	5.7	371	
Comment Text		p. 5-86		**Response Text**
Table 5.7-1 Gorge Gulch: The Hercules No. 4 site should be listed along with the Gorge Gulch riparian area.				Table modified to reflect the major source area list presented in section 4.1.
1428	Draft	5.7	372	
Comment Text		p. 5-86		**Response Text**
Table 5.7-1 Tiger-Poorman Mine: A mill site existed there, and tailings are present, but no sample results are available.				Table modified to reflect the major source area list presented in section 4.1.
1429	Draft	5.7	373	
Comment Text		p. 5-86		**Response Text**
Table 5.7-1 Hidden Treasure Mine: the adit drainage has good flow (one measurement at 1.44 cfs), and total and dissolved zinc concentration of 350-400 ppb (one sample). No samples of the upland waste rock are reported.				Table modified to reflect the major source area list presented in section 4.1.
1430	Draft	5.7	374	
Comment Text		p. 5-86		**Response Text**
Table 5.7-1 Anchor Mine: the adit drainage has low flow and low lead and zinc concentrations (one sample), no soil sample reported. We have found no information suggesting that it deserves to be considered a major source.				Table modified to reflect the major source area list presented in section 4.1.
1431	Draft	5.7	375	
Comment Text		p. 5-86		**Response Text**
Table 5.7-1 Joe Matt Mine: No samples reported; the description in Table 4.1-4 says "Upland waste rock, erosion potential." We have found no information suggesting that it deserves to be considered a major source.				Table modified to reflect the major source area list presented in section 4.1.
1432	Draft	5.7	376	
Comment Text		p. 5-86		**Response Text**
Table 5.7-1 Standard-Mammoth Campbell complex and adit: The Standard-Mammoth loading area and Standard-Mammoth No. 4 adit should be listed along with the Campbell complex.				Table modified to reflect the major source area list presented in section 4.1.
1433	Draft	5.7	377	
Comment Text		p. 5-86		**Response Text**
Table 5.7-1 The list should include the Hecla-Star Mine and mill complex, which contains a draining adit, as well as subsurface soil				Table modified to reflect the major source area list presented in section 4.1.

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and ground water samples with high metals concentrations.				
1434	Draft	5.7	**378**	
Comment Text		p. 5-86		**Response Text**
Table 5.7-1 The list for the reach between CC291 and CC282 should include the Tamarack No. 7, which is specifically mentioned in the text (Section 4.1.4.7) and contains a draining adit with high flow and metals concentrations, as well as surface soil samples also with high metals concentrations.				Table modified to reflect the major source area list presented in section 4.1.
1435	Draft	5.7	**379**	
Comment Text		p. 5-86		**Response Text**
Table 5.7-1 The Frisco site should be listed along with the Black Bear site, since they are practically undistinguishable in situ.				Table modified to reflect the major source area list presented in section 4.1.
1436	Draft	5.7	**380**	
Comment Text		p. 5-86		**Response Text**
Table 5.7-1 Silver Moon Mine: No samples reported; the description in Table 4.1-4 says "Upland waste rock, erosion potential." We have found no information suggesting that it deserves to be considered a major source.				Table modified to reflect the major source area list presented in section 4.1.
1437	Draft	5.7	**381**	
Comment Text		p. 5-86		**Response Text**
Table 5.7-1 The various locations that are part of the Gem complex should be listed as one site rather than enumerated.				Table modified to reflect the major source area list presented in section 4.1.
1438	Draft	5.7	**382**	
Comment Text		p. 5-86		**Response Text**
Table 5.7-1 West Bell Mine: No samples reported; the description in Table 4 1-4 says "Upland waste rock, erosion potential." We have found no information suggesting that it deserves to be considered a major source.				Table modified to reflect the major source area list presented in section 4.1.
1439	Draft	5.7	**383**	
Comment Text		p. 5-86		**Response Text**
Table 5.7-1 Canyon Creek floodplain areas between CC284 and CC288: We agree that those are probable major sources areas, including the areas which have been the object of SVNRT projects. In addition, riparian zones in upstream reaches should also be listed as probable major sources areas, as the sampling results (shown in Tables 4.1-2 and 4.1-4) show high surface soil, sediment, and ground water metal concentrations.				Table modified to reflect the major source area list presented in section 4.1.
1440	Draft	5.7	**384**	
Comment Text		P. 5-86		**Response Text**
Table 5.7-1 The reach between CC287 and CC288 should also list the Standard-Mammoth millsite as a potential major source.				Table modified to reflect the major source area list presented in section 4.1.
1441	Draft	5.7	**385**	
Comment Text		p. 5-86		**Response Text**
Table 5.7-1 Since some upland sites are listed, other upland sites such as the Sherman 1000 Level (Oreano adit) should be included. Surface soil samples from this site show elevated metal concentrations (shown in Table 4.1-4).				Table modified to reflect the major source area list presented in section 4.1.

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5-CSM Unit 4, Coeur d'Alene Lake				
1625	Draft	1.0	**3269**	
Comment Text		p. 1-1		**Response Text**
2nd para – A reference for the statement that populations of aquatic life in the Lake are "based mainly on either planktonic food chains in open water, or littoral…food chains in shallow water" should be cited. Ruud (1996) indicates that in Priest Lake (similar in size and trophic status to CDA Lake), benthic macroinvertebrates in profundal sediments (>10 m depth) "account for a substantial portion of the annual diet of fishes." It is not clear why this would not, under natural conditions, also be true of Coeur d'Alene Lake.				This depth of information is beyond the scope of the RI. This information was evaluated and discussed in the Ecological Risk Assessment.
1626	Draft	4.0	**3270**	
Comment Text				**Response Text**
General Comment: The nature and extent section lacks any discussion of the extent of contamination in biota of CSM Unit 4. This section should summarize what is known regarding the nature and extent of contamination of biological resources in the Lake, identify data gaps, and discuss how any data needs will be addressed.				Fish tissue data is a recognized data gap in the human health risk assessment; however, the potential for impacts to aquatic biota are evaluated in the RI and Risk Assessments through comparison of water and sediment sample results to risk-based screening levels.
1627	Draft	4.1	**3271**	
Comment Text		p. 4-1		**Response Text**
2nd para – Although the magnitudes of exceedance (10x and 100x) were "arbitrarily selected" to "delineate areas of contamination", they appear to be used as thresholds for the segment-specific summaries in sections 4 1.1 through 4.3.3. The summary sections should also include a summary of any additional chemicals which merely exceeded screening levels ("1x"). Also, there should be some discussion of samples for which detection limits were not sufficient to determine if screening levels were exceeded.				The RI is meant as a data report. To limit the length of the documents, an evaluation of results from all 18,000 samples was not performed. A review of screening levels vs reporting limits is performed as part of the risk assessment process.
1628	Draft	5.0	**3272**	
Comment Text				**Response Text**
General Comment: As mentioned in comments on Section 4 above, this section does not discuss fate and transport of chemicals of concern to biological resources in the Lake. The limited studies that exist indicate that elevated concentrations of COCs exist in benthic macroinvertebrates (Ruud, 1996) and in fish tissue (ATSDR, 1986). This section should indicate how COCs may be transported to biological resources, including movement through the food-chain.				See response to Comment #1626.
1629	Draft	5.10	**3273**	
Comment Text		p. 5-35		**Response Text**
2nd para – The concluding sentence of this section indicates that the majority of the Lake's riverine and benthic loads of metals are retained within the Lake. Although based on extremely limited information, this appears true for the benthic loads. However, based on riverine loads, this statement does not seem to be true for two of the three metals evaluated (zinc and cadmium). The majority of the cadmium inflow was in the dissolved form, and the median retention of dissolved cadmium was –3 percent. The majority of the zinc inflow was in the dissolved form, and the median retention of dissolved zinc was 32 percent.				The noted section was revised, as were other discussions of mass balance. The newer text more clearly demonstrates the changes to input metals within the lake and what is discharged from the lake.
1630	Draft	Attachment 4	**3274**	
Comment Text		p. 1		**Response Text**
1st para – The COPCs and "appropriate corresponding media" do not include biological resources. This section should either include biological data or indicate why it was not included.				A limited amount of fish tissue data were compiled and evaluated in the Human Health Risk Assessment. Part 1, Section 5.0 updated to include discussion of how tissue data were evaluated.

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	Coeur d'Alene Lake			
5-CSM Unit 4, Coeur d'Alene Lake				
1631	Draft	Attachment 4	**3275**	
Comment Text		p. 1		**Response Text**
4th para – The upper background concentrations for the South Fork basin are not appropriate screening levels for surface waters, soil, or sediments in the Lake. Both surface water and sediments entering the lake from the South Fork, under natural conditions, account for a relatively small portion of inflow to the Lake (about 10 percent). The majority of inputs, including those from the North Fork and the St. Joe, have lower background metals concentrations, which would certainly result in background metals concentrations in the Lake that are lower than those used for screening levels. Risk-based levels should be used for screening purposes until more appropriate background concentrations for the Lake can be proposed.				Background values have been revised.
1632	Draft	Attachment 4	**3276**	
Comment Text		Table 3		**Response Text**
Coeur d'Alene District soil upper background concentrations are not appropriate screening levels for the Lake. The Draft Ecological Risk Assessment indicates that background concentrations in Coeur d'Alene Lake and the Spokane River are well below the upper background levels selected as screening levels (page 5-9). Risk-based levels should be used for screening purposes until more appropriate background concentrations for the Lake can be proposed.				Background values have been revised.
1633	Draft	Attachment 4	**3277**	
Comment Text		Table 4		**Response Text**
See comments on Table 3. Screening levels based on background concentrations could be developed by weighting of background concentrations from other contributing basins (North Fork and St. Joe), or by using "unenriched" sediment concentrations from Horowitz et al. (1993 and 1995), for example.				Background values have been revised.
1634	Draft	Attachment 4	**3278**	
Comment Text		Table 5		**Response Text**
As discussed above, risk-based levels should be used for screening purposes unless/until more appropriate background concentrations for the Lake can be proposed.				Background values have been revised.
1635	Draft	Attachment 4	**3279**	
Comment Text		Table 5		**Response Text**
For surface waters, screening levels should be based on the most stringent applicable or relevant and appropriate requirement, whether based on total metals (human health criteria) or dissolved metals (aquatic life criteria). It does not make sense to have a screening level for dissolved metals that is higher than the corresponding screening level for total metals, as is the case for arsenic, iron, and mercury. Nor does it make sense to have total metals screening levels that are orders of magnitude higher than the dissolved screening level, as is the case with antimony, cadmium, copper, lead, manganese, silver, and zinc.				Disagree. The screening levels for total metals are based on protection of human health (see definitions of MCLs). The screening levels for dissolved metals are based on protection of aquatic life (see NAWQC backup documentation).
1880	Draft	2.0	**8124**	
Comment Text				**Response Text**
[Previous comment 5/240.] 7th (bottom) para: W.L. Zeigler was also superintendent of the Gem mill (Fahrenwald 1927), and had a vested interest in declaring the problem solved.				Comment noted.
1881	Draft	5.0	**8125**	
Comment Text				**Response Text**
[Previous comment 5/242.] Many of the phenomena and results presented in this chapter would benefit from being illustrated by schematics and graphs. The implications of the results and conclusions are difficult to grasp based solely on tables.				The figure for conceptual model of fate and transport (fig. 5.1) serves this purpose already.

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Coeur d'Alene Lake				
5-CSM Unit 4, Coeur d'Alene Lake				
1882	Draft	5.0	8126	
Comment Text				**Response Text**
[Previous comment 5/243.] The results of each subsection need to be summarized and interpreted for the lay reader.				Due to the complexity of the issues presented in this section and the need to keep the details intact, the summary at the end of this section and the lake summary contained in Part 7, were generated to more plainly present the conclusions of this work.
1883	Draft	5.1.1	8127	
Comment Text				**Response Text**
[Previous comment 5/244.] The discussion of partitioning and deposition in the lake could be assisted by a simple schematic of the mass balance method used.				Such was added in the revised discussion of modeling of zinc in the lake.
1884	Draft	5.1.1.1	8128	
Comment Text				**Response Text**
[Previous comment 5/246.] 1st para, discussion of detection and reporting limits: A common practice in such a case is to use half the detection limit as the assigned value. Has this been considered, or was it determined that actual concentrations were likely to be closer to the detection limit itself than to half that value?				Yes, concentrations below detection limit were assigned a value one-half of that limit. Footnotes were added to tables to indicate how many such values were used in the load calculations.
1885	Draft	5.1.2.1	8129	
Comment Text				**Response Text**
[Previous comment 5/247.] 2nd para, discussion of dissolved cadmium and filter pore size: Has any attempt been made to determine the typical 1 nm to 450 nm fraction of the "dissolved" cadmium concentrations in Coeur d'Alene Lake water? If so, was it consistent with this interpretation of the results?				No such work has yet been done for CDA Lake water. The techniques are available but increase the cost of analytical work substantially.
1886	Draft	5.1.2.1	8130	
Comment Text				**Response Text**
[Previous comment 5/248.] 2nd para, discussion of detection and reporting limits: See comment on reporting limits for cadmium, section 5.1.1.1 above (previous also comment no. 5/246).				See response to comment 67.
1887	Draft	5.2.3	8131	
Comment Text				**Response Text**
[Previous comment 5/249.] 2nd and 3rd paras, and Table 5.2-1, pp. 5-39 to 5-41: For days where the temperature is not reported but the type of inflow is identified, was the identification based on transparency results, turbidity, or on other parameters?				Text was revised to indicate methods used to determine type of inflow in absence of concurrent river and lake temperatures.
1888	Draft	5.3.1	8132	
Comment Text				**Response Text**
[Previous comment 5/250.] 2nd para, Horowitz et al. (1995) study: A figure showing the sampling locations would be helpful to comprehension.				Such information is contained in the cited document. The text describes sampling locations in a general context.
1889	Draft	5.3.3	8133	
Comment Text				**Response Text**
[Previous comment 5/252.] Woods and Beckwith (1997) study: See also previous comment no. 5/250.				Unable to determine what comment refers to.
1890	Draft	5.4.3	8134	
Comment Text				**Response Text**
[Previous comment 5/255.] 2nd and 3rd sentences: In other words, benthic organisms stirring the lake bottom mud can speed				The effects of benthic organisms on benthic flux rates was adequately described with

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chemical exchange rates.				original text.
1891	Draft	5.4.3	8135	
Comment Text				**Response Text**
[Previous comment 5/256.] 7th line: Use "macro-invertebrates" or "macroinvertebrates," not "macroin-vertebrates."				Hyphenation problem was corrected.
1892	Draft	5.4.4	8136	
Comment Text				**Response Text**
[Previous comment 5/258.] 1st para, 8th line: Use "phytoplanktonic," not "phytoplank-tonic."				Hyphenation problem was corrected.
1893	Draft	5.4.4	8137	
Comment Text				**Response Text**
[Previous comment 5/259.] 1st para, 8th line: Define diagenesis for the lay reader (the set of physical, chemical, and biologic changes undergone by sediments from the time of their initial deposition, through their conversion to solid rock, and subsequently to the brink of metamorphism).				The commentor has misapplied the concept of diagenesis and has carried it much too far in time in relation to lakebed sediments. The discussion of diagenesis in lakebed sediments clearly illustrates the chemical nature that is the focus of the discussion.
1894	Draft	5.4.5	8138	
Comment Text				**Response Text**
[Previous comment 5/260.] Please outline the practical implications of the comparison between fluxes. Also, once again the calculated results should be presented as probable ranges, not as absolute values.				Additions to the benthic flux and mass balance sections expand on the implications of relative fluxes from benthic versus riverine sources. Also, discussion was added into the document to discussion error sources. The calculated results implicitly address error via the discussion of calculation methods and data sources.
1895	Draft	5.5.3.1	8139	
Comment Text				**Response Text**
[Previous comment 5/261.] A schematic of partitioning of the different forms of nitrogen would assist comprehension.				The discussion of nitrogen does an adequate job of describing dissolved and particulate forms and how nitrogen species are differentiated.
1896	Draft	Figure 5.2-1	8140	
Comment Text				**Response Text**
[Previous comment 5/262.] Add the explanation for letter and number codes (e.g., B, C, D, E, H, J, L, M, R, S, V, 1, 2, 3, and 4) to the legend.				Text descriptions of the data collected at the sites shown on Figure 5.2-1 refer to the sampling locations.
1897	Draft	Table 5.2-1	8141	
Comment Text				**Response Text**
[Previous comment 5/263.] Define the symbol in the three right-hand columns (apparently indicating the presence of one or more of the three types of inflow) in the symbol key at the bottom.				The symbols appear to be a font problem among different types of software; editing should correct this issue. The symbol indicates the presence of the indicated condition.
Lower Coeur d'Alene River				
4-CSM Unit 3, Lower Coeur d'Alene River				
1583	Draft	1.0	3227	
Comment Text		p. 1-1		**Response Text**
Please clarify if the delta for the Coeur d'Alene River is included in this CSM Unit, or in CSM Unit 4, Coeur d'Alene Lake. Typically, deltas are associated with rivers, but it should be made very clear from the beginning of this section.				The boundary of the watershed segments are shown in Figure 1.1-1. Part of the delta is included in LCDRSeg06 and part in CDALakeSeg02.

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Lower Coeur d'Alene River				
4-CSM Unit 3, Lower Coeur d'Alene River				
1584	Draft	1.0	3228	
Comment Text		p. 1-1		**Response Text**
3rd para: The Cataldo Flats [also called "Mission Flats" later in the text] are mentioned here for the first time, but are not indicated in the figures associated with the location, including Fig. 2.2-1. Even in this figure, which shows the location of the Chamberlain and Williams (1998) study, the Flats are not indicated. The perimeter shown does not give a good idea of the Flats' extent and geometry; nor does it give an accurate representation of the Chamberlain and Williams study site.				Due to the length of the study area for this watershed, not all details could be included; however, the Mission Flats/Cataldo Flats area is clearly shown in Figure 4.1-1.
1585	Draft	2.1	3229	
Comment Text		p. 2-1		**Response Text**
[Previous comment 4/172.] We note that, unlike CSM 1 and 2, this CSM is not prepared at the watershed level, but strictly for the areas encompassed by the floodplain. This should be highlighted in the introduction.				Text modified to reflect comment.
1586	Draft	2.1	3230	
Comment Text		P. 2-1		**Response Text**
[Previous comment 4/175.] It would be helpful to include Bookstrom et al.'s discussion of glaciation, uplift, and aggradation processes in this part of the watershed.				Though additional information on the geology of the Lower Basin would refine this discussion, it does not add much to the intent of the RI of identifying contaminated areas. No text modifications made.
1587	Draft	2.1.3	3231	
Comment Text		p. 2-2		**Response Text**
[Previous comment 4/176.] There is a reference in this discussion to Figure 1.1-1; however, there are no faults indicated on this map. A geologic map would be helpful in understanding trends, and in planning response actions.				Though additional information on the geology of the Lower Basin would refine this discussion, it does not add much to the intent of the RI of identifying contaminated areas. No text modifications made.
1588	Draft	2.1.4	3232	
Comment Text		p. 2-2		**Response Text**
The term "Mission Flats" appears to be used interchangeably in the text with "Cataldo Flats". This is the first time the Mission Flats are mentioned, but the Cataldo Flats have been mentioned before. Please make terminology consistent.				Text modified to reflect comment.
1589	Draft	2.1.5, 2.1.6	3233	
Comment Text		P. 2-2		**Response Text**
[Previous comment 4/178.] The first two sentences of Section 2.1.6 refute the sentence of 2.1.5. Please coordinate.				Text modified to reflect comment.
1590	Draft	2.1.6	3234	
Comment Text		P. 2-4		**Response Text**
Please confirm that the location for and history of the Pine Creek tailings dam referenced in this section is included in the appropriate segment of CSM 2.				Text in the Pine Creek report modified to reflect comment.
1591	Draft	2.1.6	3235	
Comment Text		p. 2-5		**Response Text**
[Previous comment 4/185.] 1st para (quote from Lewis A. Grant): Please cite the typical detection limit for lead at the time, to place the statement in perspective.				This information is not readily available.

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1592	Draft	2.1.6	3236	
Comment Text		p. 2-6		**Response Text**
[Previous comment 4/188.] Please include some reference to the fact that tailings from the Cataldo dredge deposits were used in the construction of I-90. Our previous comment (4/188) emphasized that the I-90 work had used only a fraction (about 3%) of the dredge spoils and not, as seemed implied, the bulk of the materials. However, now the current version of the RI does not mention any use of dredge spoils in the construction. The State of Idaho estimates that approximately 34.5 million tons of mixed alluvium and tailings were dredged from the river between 1933 and 1967 (SVNRT, 1998). In the mid-1960s, the Idaho Department of Transportation purchased approximately 1 million tons of the dredge spoils for use in constructing the roadbed of 1-90 (Casner, 1991; SVRNT, 1998). Design drawings available from the Idaho Department of Transportation indicate these tailings were used mostly in the access ramps near the Mission.				Text modified to reflect comment.
1593	Draft	2.2.1	3237	
Comment Text		p. 2-7		**Response Text**
[Previous comment 4/189.] 2nd para: Some of the information in this paragraph should also be included in Section 2 1.2 for consistency.				Though additional information on bedrock geology of the Lower Basin would refine the discussion of hydrogeology, it does not add much to the intent of the RI of identifying contaminated areas. No text modifications made.
1594	Draft	2.2.1	3238	
Comment Text		p. 2-8		**Response Text**
[Previous comment 4/191.] It may be pertinent to include the results of work by USFWS (Campbell et al. 1999) that documents the lateral extent of contamination (area), and shows that the average depth is less than one meter in thickness. The text as is conveys a picture of much thicker deposits overall.				The Campbell study included results of sediment samples collected from the top 15 cm and does not include an estimate of extent of contamination at depth. The data presented and discussed in this section of the RI reflect the results of sediment samples from numerous cores collected for the RI during FSPA Nos. 1 and 3.
1595	Draft	2.3	3239	
Comment Text		p. 2-12		**Response Text**
1st para: The drainage area and river length included in this para is incorrect and inconsistent with that presented in Section 2 1. Please revise to indicate a drainage area of over 252 square miles, and a length along the river of 34.7 miles.				Text has been modified
1596	Draft	2.3	3240	
Comment Text		p. 2-12		**Response Text**
[Previous comment 4/197.] 7th line: "…Clark Creek Swan Creek…" should be "…Clark Creek, Swan Creek…".				Text has been modified
1597	Draft	2.3.1, 2.3.2, 3.2.1	3241	
Comment Text		p. 2-12, 2-13, 3-4		**Response Text**
[Previous comment 4/199.] This section apparently does not include the review of the work that was performed by Beckwith et al. (1996) concerning flood peak flows and contaminant transport from flood events. It is very helpful, particularly with respect to flood conditions in the Lower CdAR. This is particularly important to the understanding of contaminant transport at the upper ends of the flood hydrograph, and an updated peak flood flow value at Cataldo.				Information from the two Beckwith fact sheets added to Section 2 3.2. Sediment loading information not reported by Beckwith et al 1996.
1598	Draft	2.3.2.3	3242	
Comment Text		p. 2-13		**Response Text**
There is a comparison that shows how the 1999 water year deviates from normal average rates, and a statement that reads" While these comparisons do not address monthly variations in precipitation, they do indicate that the water budget for water year 1999 was				The total water budget for 1999 is very similar to the long term average. The lower than average snowfall is mentioned. As such, 1999 was "somewhat typical".

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somewhat typical with above average total precipitation and below average snowfall". Please re-phase this statement. If it were "typical", there would not be a 32.9-inch (70%) variance from average snowfall, and a 9 percent variance in rainfall. Note this is on the dry side, making all of the estimates of loading based upon these values would tend towards an underestimate. Please correct in both places it occurs.				
1599	Draft	2.3.2	**3243**	
Comment Text		p. 2-29		**Response Text**
Table 2 3.2-2 The WRCC precipitation station at Coeur d'Alene has a near 100-year record; it may be pertinent to include this data as a comparison to the 1999 water year data that was used. Note this type of information – with a longer period of record – is used for modeling design for containments and other portions of the alternatives for the FS.				Table has been modified
1600	Draft	3.0	**3244**	
Comment Text		p. 3-1		**Response Text**
[Previous comment 4/209.] 5th para: "…approximately 51,080 tons of sediment was transported…" Round to 51,000 tons to avoid implying exaggerated precision.				Text has been modified
1601	Draft	3.0, 3.2.1, 3.3	**3245**	
Comment Text		p. 3-1, 3-3, 3-8		**Response Text**
There is a discrepancy between the total amount of suspended sediment presented in Section 3.0 (51,080 tons of sediment) and in Sections 3.2.1 and 3.3 (50,150 tons). Please verify and coordinate these references for consistency.				Text has been modified
1602	Draft	3.2.1	**3246**	
Comment Text		p. 3-2		**Response Text**
A sediment transport analyses has not been performed for the channel segment from Cataldo to Rose Lake. This is a serious oversight. There is a brief discussion indicating that "significant quantities of sediment are deposited in the 8 mile reach upstream of the Rose Lake gage." However, there is no quantification of this pathway, nor is there sufficient information provided to support the development of alternatives to address this reach in the FS.				Comment noted, it is unfortunate that sediment transport data are not available.
1603	Draft	3.2.1	**3247**	
Comment Text		p. 3-2		**Response Text**
[Previous comment 4/210.] 3rd para: Again, numbers given are not limited to significant digits. Regression lines presented in Figures 3.2-1 and 3.2-5 clearly show that this is only a rough estimate, and numbers should likely be limited to two significant digits.				Text has been modified.
1604	Draft	3.2.1	**3248**	
Comment Text		p. 3-3		**Response Text**
This discussion generally does not include a full discussion of the segment of the River from Cataldo to Rose Lake. This is a serious oversight. As an example, there is no discussion of the change in gradient and subsequent stream energy that occurs in this reach. The gradient is in transition in this reach (from the steeper slopes found in the South and North Forks), and the change in momentum from the faster moving North Fork and South Fork waters results in deposition of larger grained sediments and other materials in this reach (see Bookstrom et al. 1999).				Discussion of Cataldo to Rose Lake is contained in the Main Stem Coeur d'Alene River Watershed report
1605	Draft	3.2.1	**3249**	
Comment Text		p. 3-2, 3-3		**Response Text**
[Previous comment 4/212.] A discussion of discharge and sediment transport with respect to bankfull flow would be pertinent and helpful.				Bankfull discharge information added to Section 2.3.2.2.

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Lower Coeur d'Alene River				
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1606	Draft	3.2.1	3250	
Comment Text		p. 3-2, 3-3		**Response Text**
[Previous comment 4/213.] Was any work done to correlate metals transport with sediment quality? This would also be pertinent. In addition, the question of whether the sediment load is coming from boat wakes or from flooding was not addressed.				No. Given the limited amount of sediment transport and sediment chemistry data available, this was not attempted. Studies have not been conducted to determine if sediment load is coming from boat wakes or flooding. Boat wakes and flooding added as a potential mechanisms of bank erosion.
1607	Draft	3.2.3, 5.3.1	3251	
Comment Text		p. 3-5, 5-9		**Response Text**
[Previous comment 4/214.] The channel description does not take into account the enormous amount of large rock riprap placed along many of the bends of the lower CdAR after the 1933 flood. This may bear some discussion, as it definitely affects normal sinuosity and other natural geomorphic processes of the River. Much of this original riprap is intact, and would affect the ability of a channel to avulse.				This comment was made on the section of the RI Report that describes MidGradSeg04 of the mainstem Coeur d'Alene River, from Cataldo upstream to the confluence. Available mapping indicates that most of the riprap on the mainstem of the Coeur d'Alene River was placed downstream of Cataldo, which is not in MidGradSeg04 (Bookstrom, et al 1999). In consideration of the riprap, to which the comment was presumably directed, it is one of several important factors controlling the geomorphology of the river downstream of Cataldo. Another important factor is the Post Falls Dam, which placed the Coeur d'Alene River under backwater conditions, altering its previous natural tendencies. Additionally, sediment input to the mainstem has changed over the last century due to mining and forestry practices. The relative importance of these factors on the natural geomorphological processes of the river is unclear.
1608	Draft	3.2.3	3252	
Comment Text		p. 3-5 to 3-8		**Response Text**
[Previous comment 4/216.] Rather than (or at least in addition to) relying on a study prepared for the PRPs, this section should use the work done by Bookstrom et al. (1999). Wesche looked at erosional areas, without consideration of whether the eroding areas were contaminated. In outside (cut-bank) margins of meander beds (locations of high erosion), the pre-1968 tailings-contaminated materials have been entirely eroded and the older, clean material is currently being eroded (Bookstrom et al. 1999). However, contaminated sediment is still being transported from upstream (from the South Fork) and mixing with other sediment. The strict focus on bank erosion is looking at the symptom, not the cause; the river is trying to find its equilibrium given the constraints of gradient, flow, sediment loads, etc. We recommend that A. Bookstrom of USGS be asked to peer review the entirety of section 3.				A. Bookstrom was a peer reviewer of this report and did not supply comments on this section. The Wesche report identified distinct areas of erosion within this watershed. The Bookstrom report mapped areas of contaminated sediments and did not discuss erosional areas specifically. Text has been added to page 3-1 of this report describing the results of the Bookstrom study.
1609	Draft	3.2.3.3, 3.2.3.4	3253	
Comment Text		p. 3-7		**Response Text**
[Previous comment 4/217.] 3.2.3 3, 3rd para, and 3.2.3.4, 2nd para: "Lake Killarny" – called (note spelling) "Killarney Lake" in the rest of the document, including figures, as well in USGS maps.				Text has been modified
1610	Draft	3.2	3254	
Comment Text		Figs. 3.2-8 to 3 2-12		**Response Text**
[Previous comment 4/218.] Is it possible to determine an average or mean annual sediment transport rate?				An estimate of average annual sediment transport is provided in Table 3 2-1
1611	Draft	3.2	3255	
Comment Text		Figs. 3.2-9 to 3 2-14		**Response Text**
[Previous comment 4/219.] These figures are very difficult to read in black and white. They also need to be spell-checked.				Figures have been modified.

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Lower Coeur d'Alene River				
4-CSM Unit 3, Lower Coeur d'Alene River				
1612	Draft	4.1	3256	
Comment Text		p. 4-1		**Response Text**
[Previous comment 4/220.] No discussion of contaminants of concern. Lead is more important here than in CSMs 1 and 2 because of waterfowl and other wildlife exposure. Also, in addition to the three contaminants modeled (cadmium, lead, and zinc), concentrations of antimony, arsenic, copper, mercury and silver in sediment are high, as are concentrations of antimony, arsenic, and copper in surface soils. It appears from the limited data that these metals are also elevated in surface water both in their total and dissolved forms, but the number of samples analyzed for those metals was comparatively small.				The nature and extent sections are intended as data reports. A detailed discussion of results of all 18,000 samples was not within the scope of this evaluation.
1613	Draft	4.1.1, 4.1.3	3257	
Comment Text		p. 4-2 to 4-4		**Response Text**
[Previous comment 4/221.] No subsections on surface water for segments LCDRSeg01 and LCDRSeg03. In other chapters, a paragraph is still inserted to explain that no samples were taken in that reach; the same should be done here for consistence.				Commentor is incorrect. If no samples were collected a specific matrix, a section was not created for that matrix.
1614	Draft	4.1.7	3258	
Comment Text		p. 4-6		**Response Text**
Figure 4.1-11 Please site source of video (we believe it is CdA Tribe). In addition, we the USGS has developed an estimated for the peak flow rates for this event.				Section re-written to include discussion of the 1996 and 1997 flood events and includes peak flow rates.
1615	Draft	4.2.2	3259	
Comment Text		p. 4-7, 4-8		**Response Text**
[Previous comment 4/222.] The results for the four sampling events differ markedly from the annual summaries presented by Woods (2000).				The mass loading quantities presented in this section are instantaneous loads for the available sampling data. The USGS report presents mean daily discharges and annual loads only for water year 1999. It is acknowledged in the RI that from year to year, discharge, concentration, and mass loading is highly variable (as reflected in this observed difference in reported mass loadings), which is why we chose to use a probabilistic model to evaluate available surface water data.
1616	Draft	4.2.2.3	3260	
Comment Text		p. 4-8		**Response Text**
Previous discussions relative to ground water interactions with the river indicate a ground water-to-surface water pathway, rather than "ground water away from the river" as indicated in this section. Please review and revise as appropriate.				Text revised to reflect hydrogeology discussion in Section 2 2.3.
1617	Draft	5.2	3261	
Comment Text		p. 5-1 to 5-8		**Response Text**
[Previous comment 4/224.] 1st para: Some features mentioned are not identified in the referenced figure (Fig. 5.2-1), e.g , Bull Run Lake and the town of Harrison.				Harrison is outside the boundary of this figure. Bull Run Lake label added.
1618	Draft	5.2	3262	
Comment Text		p. 5-1 to 5-8		**Response Text**
[Previous comment 4/225.] See also earlier comments on Part 2: Moon Creek, section 5.2 and subsections; and Part 2: Canyon Creek, sections 5.4 and 5.5, and subsections.				No response required.
1619	Draft	5.2, 5.4	3263	
Comment Text		Figs. 5.4-7, 5.4-9		**Response Text**
[Previous comment 4/226.] The results presented differ markedly from the annual summaries presented by Woods (2000).				The USGS report presents mean daily discharges and annual loads only for water year

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Comment No.	Version	Subsection / Add'l Ref	Doc ID	
Lower Coeur d'Alene River				
4-CSM Unit 3, Lower Coeur d'Alene River				
				1999. It is acknowledged in the RI that from year to year, discharge, concentration, and mass loading is highly variable (as reflected in this observed difference in reported mass loadings), which is why we chose to use a probabilistic model to evaluate available surface water data.
1620	Draft	5.2.1	3264	
Comment Text		p. 5-2, 5-3		**Response Text**
[Previous comment 4/227.] Please remember that there are numerous readers of this document. It is very difficult to wade through the statistics to determine what they are trying to say. Is it possible to condense this into a succinct paragraph indicating that statistical methods were used, and include this into an appendix?				The modeling methodology are summarized in Part 1, Section 5 and described in detail in a separate Technical Memorandum. This section presents specific results of the modeling which is required for documentation. A brief summary of conclusions that a general audience can understand is included in Section 5.4.
1621	Draft	5.2.3	3265	
Comment Text		p. 5-5		**Response Text**
Please revise the 5th sentence such that it does not appear that the UPRR is remediating the dredge spoils; this is not an element of their response action.				Text modified to reflect comment.
1622	Draft	5.2.4	3266	
Comment Text		p. 5-6		**Response Text**
[Previous comment 4/229.] 3rd para: The estimated discharge and total zinc concentration both decrease but the estimated total zinc load increases. The revised text notes this inconsistency, but we would like to see an explanation suggested for this situation.				The discharge in this reach increased (Table 5.2-2) which is consistent with the load increase for total zinc. Text corrected.
1623	Draft	5.2.6	3267	
Comment Text		p. 5-8		**Response Text**
[Previous comment 4/231.] 2nd and 3rd para: Several significance levels are so high (alpha = 0.27 to 0.45) as to be almost meaningless. Token mention is made in the revised text, but not in language that will allow the lay reader to understand the high level of uncertainty that is involved or place the results in perspective.				Section deleted.
1624	Draft	5.3.1	3268	
Comment Text		p. 5-9		**Response Text**
3rd para: We concur with the statement: "Bank erosion does not occur in a linear manner; rather episodic bank erosion occurs over discrete high-flow events, or during rapid drawdown of the river level." However, the sediment transport analysis did not include this obvious sediment source, and therefore most likely underestimated the total sediment load through the basin.				Bank erosion is listed as a source of sediment to the river on page 5-10, Section 5.3.2 and on pate 3-8, Section 3.3.
Main Stem Coeur d'Alene				
3-CSM Unit 2, Midgradient Watersheds				
1560	Draft	1.0, 1.1, and 1.2	3204	
Comment Text				**Response Text**
It would be very helpful to place the report organization in Section 1.2 information at the very beginning of the report in Section 1.0 or at least a sentence there relative to where the particular watershed report fits in the big picture. This would be particularly helpful for this watershed, since this report covers only one segment of CSM Unit 2.				Section 1.0 already contains a description of the physical location of this watershed and what CSM Unit it is in. This is a companion document to Part 1 - Introduction where the CSM for the basin is presented in detail.

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Main Stem Coeur d'Alene

3-CSM Unit 2, Midgradient Watersheds

1561 Draft — 1.0 — **3205**

Comment Text — p. 1-1

This section mixes information regarding clean-up actions by others in the lower South Fork and upper Main Stem. Please revise the clean-up actions by others for this segment (upper Main Stem) to read as follows (replaces 2nd, 3rd, and 4th paras of Section 1.0):

"Several clean-up actions have been implemented in the Coeur d'Alene River watershed between the confluence and Cataldo. These actions are primarily to protect human health and are response actions as implemented by the USEPA and the Union Pacific Railroad. As a part of the Consent Decree for the UPRR Wallace-Mullan Branch, contaminated soils and ballast materials within the UPRR ROW along the South Fork between the confluence and Cataldo are to be covered with an asphalt, gravel or soil barrier, depending upon location. This action also includes limited removals of contaminated materials within selected railroad sidings near Enaville and Cataldo. One home adjacent to the UPRR ROW will be sampled; depending upon sample results, any residual contamination will be addressed. Fencing, large boulders and hostile vegetation are used to prevent access to contaminated areas along the River at portions of the ROW near Enaville and the old CCC Road west of Enaville (MFG, 1999). Implementation of this portion of the UPRR Response Action is also planned for the year 2000/2001 (MFG, 2000)."

Similar revisions should be made to the descriptions of clean-up actions in other segments to reflect only that construction occurring within that particular segment.

Response Text

Text modified as per comment.

1562 Draft — 2.1.5 — **3206**

Comment Text — p. 2-2

It may be helpful to provide a description of where the Hypotheek Mine is: up French Gulch, a tributary of the Main Stem CdAR west of the ridge separating it from the Matchless Gulch and the main stem of Pine Creek.

Response Text

Text has been added to clarify the location of the Hypotheek Mine.

1563 Draft — 2.1.6 — **3207**

Comment Text — p. 2-2

The discussion of the Hypotheek site may need to be revised pending resolution of the definition of primary sources in Sections 4 and 5. These sections do not address the Hypotheek Mine. Either Sections 4 & 5 need to address the Hypotheek as a source, or the amount of discussion for this site should be truncated, with an explanation that it is not a primary source. As it is, with the amount of attention received, it appears to be a source comparable in importance to the Lucky Friday or other major source, which we do not believe to be the case.

Response Text

Samples were not collected from this potential source area as part of this RI/FS; therefore, contributions of metals from this area to the Main Stem were not quantified. This situation is not unique to the RI. Many source areas were not sampled; however, due to similarities in mining and waste disposal practices, source areas were not eliminated from inclusion in the RI just because data are not available.

1564 Draft — 2.1.6.2 — **3208**

Comment Text — p. 2-3

Check with D. Fortier (BLM) and sources cited (Mitchell and Bennett); there may have been a mill up French Gulch. Conversely, it may be pertinent to mention that the production from the Hypotheek is often included with that of the adjacent Pine Creek watershed. It could be that this material was processed at one or more of the mills in Pine Creek. In addition, Table 2 1.6-1 indicates a mill at Hypotheek.

Response Text

The mine apparently had a mill in French Gulch. The text has been modified to reflect the presence of the mill.

1565 Draft — 2.1.7 — **3209**

Comment Text — p. 2-3, 2-4

Please revise the boiler plate language of this section to match the source; it is not certain how extensive the workings of this mine are relative to the other sources in the South Fork.

Response Text

Text has been added to indicate no information is available concerning adit discharge for the Hypotheek Mine.

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Main Stem Coeur d'Alene				
3-CSM Unit 2, Midgradient Watersheds				
1566	Draft	2.2.1	3210	
Comment Text		p. 2-4		**Response Text**
Please revise the bullets under the 4th para to reflect this portion of the watershed; there are several bullets that refer to reaches upstream of this segment, and also from CSM 3.				As stated at the beginning of this section, very little hydrogeologic data are available for this segment, therefore, results from a regional study by Norbeck are presented here.
1567	Draft	2.2.2	3211	
Comment Text		p. 2-5		**Response Text**
The aquifer parameters reflect a wide range in hydraulic conductivity obtained from the upper watershed of the Smelterville Flats/Bunker Hill formation. As the range provided encompasses several orders of magnitude of flowrates (500 –10,790 ft/day), it may be prudent to add a note indicating a high degree of variability and that specific on-site data will be required during design.				Text modified as per comment.
1568	Draft	2.2.4	3212	
Comment Text		p. 2-5		**Response Text**
The presumption of gaining and losing reaches in the South Fork is derived from the proximity of bedrock units to the surface alluvium and to the cross sectional area of the alluvium. As the bedrock in this portion of the watershed is quit a bit deeper, the cross sectional area is greater, and the sediment grain size is smaller, this presumption may not hold for this segment. Studies that are more specific conducted immediately downstream of Cataldo by Chamberlain and Williams (1998) indicate a net gain to the river from ground water. It may be more pertinent to include this in the discussion.				The Chamberlain and Williams study results are included in Section 4 2.2 3 and copied here.
1569	Draft	2.3.1, 2.3.2	3213	
Comment Text		p. 2-6, 2-7		**Response Text**
It may be pertinent to include the work completed by Beckwith et al. (1996) concerning flood peak flows and contaminant transport from the flood events in 1996. This is particularly important to the understanding of contaminant transport at the upper ends of the flood hydrograph, and an updated peak flood flow value at Cataldo.				Comment noted. Impacts from the floods in 1996 and 1997 are discussed in the Lower CDAR report (Section 4.0).
1570	Draft	2.3.2.3	3214	
Comment Text		p. 2-8		**Response Text**
There is a comparison that shows how the 1999 water year deviates from normal average rates, and a statement that reads" While these comparisons do not address monthly variations in precipitation, they do indicate that the water budget for water year 1999 was somewhat typical with above average total precipitation and below average snowfall". Please re-phase this statement…. If it were "typical", there would not be a 20-inch (56%) variance from average snowfall, and a 20 percent variance in rainfall (Note this is on the dry side, making all of the estimates of loading based upon these values underestimates.) Please correct in both places it occurs.				The total water budget for 1999 is very similar to the long term average. The lower than average snowfall is mentioned. As such, 1999 was "somewhat typical"
1571	Draft	2.3	3215	
Comment Text		p. 2-16		**Response Text**
Table 2 3.2-2: The WRCC precipitation station at Kellogg has a near 100-year record; it may be pertinent to include this data as a comparison to the 1999 water year data that was used. (Note this type of information – with a longer period of record – is used for modeling design for containments and other portions of the alternatives for the FS).				The 100 year record is included in the long term averages. Monthly averages have been added to the table.
1572	Draft	3.1, 5.3.2	3216	
Comment Text		p. 3-1, 5-7		**Response Text**
It is unfortunate that sediment transport data sufficient to allow sediment transport analyses of the Main Stem Coeur d'Alene River is not available. It is also unfortunate that the estimate for the Rose Lake gage, nearly 8 miles downstream of Cataldo, and nearly 13.4 miles downstream of the Confluence was apparently used for a surrogate. This is highly inappropriate. As discussed in				Indeed it is unfortunate that sediment transport data does not exist. However the Rose Lake gage is near the downstream end of MidGradSeg04. As such, this gage is representative of sediment passing through and generated in MidGradSeg04. The data

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Main Stem Coeur d'Alene

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Section 3.2.3, the slopes within this segment vary from 0.12 to 0.16 percent (for context, the slopes near the Rose Lake gage are around 0.019 percent, an order of magnitude less than in this transition zone). The estimate of channel sediment transport capacity would be affected by this difference, with the channel near Cataldo having much greater theoretical sediment transport capacity. Another difference in the two locations is that the Rose Lake gage lies at the upper bound of backwater effects from the Lake; this condition would also serve as a "hydraulic brake" allowing fine sediment deposition. Section 3.2 3 also discusses the presence of "large gravel bars" along the channel margins. This information strongly infers the likelihood for a depositional zone within this channel segment, with deposition of much larger material than the silt and sand-sized particles found near Rose Lake. It may be more appropriate to either use the sediment and flow data from the Enaville station or use grain size data from the sediment sampling performed, and to develop a theoretical transport value based on the range of flowrates from the channel and one or several of the available sediment transport formulae.

represent the changing character of the channel from the confluence to Rose Lake, including the decrease in slope and deposition of larger particles within this reach. The text of this section has been revised

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1573 Draft | 3.2.3 | **3217**

Comment Text | p. 3-3

It may be pertinent to include a discussion of the USGS mapping of relic channels in this area (see Bookstrom et al. 1999)

Response Text

Comment noted. Due to the large geographic area covered in the RI/FS, it is not practical to present channel descriptions at the level of detail requested.

1574 Draft | 4.0 | **3218**

Comment Text | p. 4-1

The 1st para of this section indicates that "horizontal and vertical extent" of contamination in the environmental media would be provided. Unfortunately, the level of detail in this segment was similar to the other Nature and Extent Sections.

Response Text

The nature and extent sections are intended as data reports. A detailed discussion of results of all 18,000 samples was not within the scope of this evaluation.

1575 Draft | 4.1 | **3219**

Comment Text | p. 4-2

There is a statement in this section that should be rectified and then removed. The 7th para of this section reads" It should be noted that the number of samples identified for each source area was determined using the Geographical Information System. Only sampling locations indicated within a source area polygon (shown on Figure 4.1-1 and 4.1-2) are included in Table 4.1-1; therefore, there may be samples collected from source areas and listed in data summary tables in Attachment 2 that are not accounted for in Table 4.1-1." It is extremely unfortunate that the limits of the electronic media are apparently dictating the presentation of data. If there are sample data that indicate contamination, they should be presented, rather than adhering to an electronically generated map of approximate source identifications.

Response Text

The nature and extent sections are intended as data reports. A detailed discussion of results of all 18,000 samples was not within the scope of this evaluation; therefore, electronic tools were used to streamline the evaluation. Though some samples may have been excluded using this technique, we believe this to be an effective tool in screening data.

1576 Draft | 4.1.1.5, 5.2.2.2 | **3220**

Comment Text | p. 4-3, 5-5

4.1.1.5- 2nd para: This para indicates that five sources are located in this segment; four are listed in Table 4.4-1. However, no samples were collected at these sites; this begs the questions – why not and what about Hypotheek? Please revise this section to be consistent with the equivalent sections in other reports. If these are major sources, please identify them. If it is a diffuse sediment that is the source, it should be identified. In addition, Section 5.2 2.2 indicates that there are no significant sources of mining wastes in this watershed, but addresses numerous deposits of alluvium contaminated by mining wastes. Please coordinate.

Response Text

The Hypotheek mine is broken into two polygons (BLM 1999), therefore there are "five" source areas in this segment. Section 4.0 is a data report presenting available sample results. Resources are not available to sample and evaluate all 1,080 source areas identified, therefore impacts were evaluated using available information. Impacts to surface water, the primary medium of concern in this segment, were evaluated using the probabilistic model. See section 5.0 for results.

1577 Draft | 4.2.2 | **3221**

Comment Text | p. 4-4

We agree with the statement that the "historic mass loading estimates in the basin during high flow are biased low.' Please see above global comments regarding previous work by McBain and Trush (2000) with respect to sediment transport thresholds.

Response Text

The McBain and Trush information was reviewed for this evaluation and generally supports the work by the USGS that is presented in the RI.

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1578	Draft	4.2.2, 5.2.2.2	3222	
Comment Text		p. 4-4, 5-5		**Response Text**
3rd para may not be consistent with statements made in the FS, or with Section 5 2.2.2 concerning lead loading from the North Fork. It may be prudent to revisit this discussion and add a brief discussion relative to load being a result of concentration and discharge. Thus, while the concentrations from the North Fork may be relatively low; because of the higher flow rates, the total load may be significant. It is unfortunate that sampling on the North Fork was not performed to assess the relative load from this stream.				Text modified to indicate that the North Fork is not a major loader when compared to the cumulative load estimated at Pinehurst. The method for calculating mass load from discharge and concentration is provided in Part 1 - Setting and Methodology, Section 5.3.1.
1579	Draft	4.2.2.1, 4.2.2.2	3223	
Comment Text		p. 4-5		**Response Text**
3rd and 4th sentences: Please make the following modifications for clarity: "The USGS synoptic sampling event in May 1999". The increase at LC50 was 1,952 pounds per day. A similar change should be made in the equivalent sentences in 4.2 2.2.				Text modified as per comment.
1580	Draft	4.2.2.3	3224	
Comment Text		p. 4-6		**Response Text**
The Chamberlain and Williams (1998) study of the Cataldo/Mission Flats may be more pertinent to this area than the USGS study at the Osburn Flats.				Summary of Chamberlain and Williams conclusions added to this section.
1581	Draft	4.1	3225	
Comment Text		Figs. 4.1-1, 4 1-2		**Response Text**
We suggest showing the location of the Pinehurst Narrows Dam, as it is referred to elsewhere in each figure.				Figures modified to reflect comment.
1582	Draft	4.1	3226	
Comment Text		Table 4.1-1		**Response Text**
It would be helpful to include these sources both in a figure and in the text.				Because records were not found on the Linfor Copper or Mission Group source areas and samples were not collected from them, no discussion was added to the text. Additionally, these sources are outside the boundaries of this CSM unit.
South Fork				
3-CSM Unit 2, Midgradient Watersheds				
1538	Draft	2.1	3182	
Comment Text		p. 2-1 to 2-7		**Response Text**
[Previous comment 3/286.] Among the mining-related sources, tailings accumulations due to plank dams that later washed out (e.g., Osburn, Pinehurst), tailings-contaminated sediment deposited by flood events (e.g., Osburn Flats, Smelterville Flats, current-day CIA site), and man-made impoundments (e.g., CIA, Page Ponds); these sources and the related processes are described by Box et al. (1999).				Text modified to reflect comment.
1539	Draft	2.1.3.1, 2.1.3.2	3183	
Comment Text		P. 2-2, 2-3		**Response Text**
[Previous comment 3/273, 3/277.] These topics (tailings and waste rock piles) should be grouped under a separate section entitled "Mine Wastes" rather than as a subsection of "Soils."				A new section "Mine Wastes" has been created
1540	Draft	2.1.3.2	3184	
Comment Text		P. 2-3		**Response Text**
[Previous comment 3/277.] This should be in a separate section entitled "Mine Wastes."				A new section "Mine Wastes" has been created

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	South Fork			
3-CSM Unit 2, Midgradient Watersheds				
1541	Draft	2.1.5	**3185**	
Comment Text		p. 2-4		**Response Text**
[Previous comment 3/280.] Note that the production statistics attributed to Stratus (1999) were obtained by Stratus from Ridolfi (1998). Ridolfi in turn compiled this information from Mitchell and Bennett (1983) and SAIC (1993a). The original references should be used. Note that the compiled statistics do not include production after 1990.				The text has been modified to reflect the original data sources, and to be consistent with similar sections for other watersheds
1542	Draft	2.1.5.1	**3186**	
Comment Text		p. 2-5		**Response Text**
[Previous comment 3/281.] 4th sentence, suggested rewrite: "Not all mining locations in the watershed are listed. Only mines with available ore production records are included. Although some mines that produced ore maybe excluded because of lack of documentation, their share of the total ore produced in the watershed is extremely small."				The comment is acknowledged. The text already includes a description of the limitation of this list.
1543	Draft	2.1.5.2	**3187**	
Comment Text		p. 2-5		**Response Text**
[Previous comment 3/282.] Last sentence: This sentence implies that some mills are known but are not listed because records were not found. Perhaps the sentence means to say that some mills may have existed but are unknown at this time because records of their existence were not found.				Text modified to reflect comment.
1544	Draft	2.1.6.2	**3188**	
Comment Text		p. 2-6		**Response Text**
[Previous comment 3/285.] Although the Bunker Hill Mining Complex and the Box are covered by another RI/FS, it is essential to comprehension of the system to at least sum up briefly the nature of the site and the sources it contain, and the recent work done, perhaps in a separate section (e.g., 2.1.7). In addition, it is necessary to explain that the river was explicitly excluded from the 1992 ROD.				To limit the size of this document, a summary of conditions in the "Box" is not included in this watershed report but is included in Part 1 Section 1.1. The description of the site and its relationship to the Box is included in Section 1.0.
1545	Draft	2.2.1.2	**3189**	
Comment Text		p. 2-9, 2-24, 2-25		**Response Text**
Figs. 2.2-1, 2 2-2 [Previous comment 3/288.] In addition to Dames & Moore (1991) and MFG (1992), more work was done by CH2M Hill. Dawson and Stoupa (1996) point out some erroneous assumptions in previous work. Barton (2000) completed a study of ground water/surface water interactions for the RI. In general, the information presented in section 2.2 and accompanying figures is dated.				Results of Barton's seepage study added to page 2-13. This study covered one area within the Bunker Hill Superfund Site (BHSS). The Dawson/Stoupa report covers seepage from the Central Impoundment Area (CIA) in the BHSS. Though refinements were made to the interpretation of the MFG dataset (see excerpt below), these details were not discussed in this section of the RI. Because this RI/FS focuses on areas outside of the BHSS, the write-up has not been updated to include a lengthy discussion of contributions of water to the South Fork specifically from the CIA. (Also note that Section 2 2 of this RI was written by the hydrogeologist from CH2M HILL and is part of the current project team working on issues in the BHSS with J. Stoupa). Dawson/Stoupa 1996: The Hydrogeologic Assessment (MFG 1992) had one somewhat misleading conclusion with respect to the CIA. The Assessment stated that the CIA East cell contributed approximately 70 percent of the average CML loadings to the SFCDR leaving the site.

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	South Fork			
3-CSM Unit 2, Midgradient Watersheds				
				In making this statement (and in the various tables in which sources were ranked) groundwater inflow and surface water inflow from the SFCDR to the study area were not considered sources. Further, only SFCDR flows leaving the study area were considered. Groundwater flows leaving the site may be equally important. Finally, the model had not been calibrated to existing measured flows. Figure 6-6 in Appendix A is the summary of CML balance from the Hydrogeologic assessment. Because the model has not been calibrated, the sum of all inflows to surface water and ground water from Figure 6-6 are about 40 percent higher than the sum of all the outflows. It is probably more appropriate to interpret the information in Figure 6-6 by concluding that the CIA East and the SFCDR from upstream of the site each contribute 40 percent of the total CML entering the site.
1546	Draft	3.2.1.1	**3190**	
Comment Text		p. 3-3		**Response Text**
[Previous comment 3/291.] 2nd para: "This value is in the range of values expected for this area and land use." What is that range and how is it estimated (This question pertains to the equivalent text in section 3 2.1.2 as well)?				Text has been removed from Section 3.2.1.1. Equivalent text was not in Section 3.2.1.2.
1547	Draft	5.2.2.1.2	**3191**	
Comment Text				**Response Text**
[Previous comment 3/297.] It should be emphasized that the large load increase through Segment 2 is likely to remain substantial even after the current remediation work is finished within the Box.				The BHSS is a major loader to the South Fork. As EPA progresses with remedy selection for the Basin, cleanup actions will be coordinated with actions at the BHSS.
1548	Draft	4.1	**3192**	
Comment Text		Figs. 4.1-1 thru 4.1-7, Table 4.1-1		**Response Text**
Polygon (source area) KLE012 is mislabeled as "Silver Summit Tailings Pond." This label has been switched with that of polygon KLE011, mislabeled as "Silver Crescent Tailings." The Silver Summit site is situated south of the South Fork, near lower Rosebud Gulch, while the Silver Crescent site is situated in upper Moon Creek. KLE012 Silver Crescent Tailings is part of the Moon Creek watershed and should not be discussed in this section.				Text, tables and figures corrected.
1549	Draft	5.4	**3193**	
Comment Text		p. 5-48		**Response Text**
Table 5.4-1 Once again we suspect that Silver Crescent Tailings mentioned here is actually the Silver Summit Tailings Pond. The Silver Crescent site should not be listed as a source in this section since it is a source for the Moon Creek section.				Table deleted and replaced with text narrative describing major source areas to be consistent with the FS.
1550	Draft	4.1.1.6, 4.1.2.6, and Table 5.4-1	**3194**	
Comment Text		p. 4-4 to 4-6, 5-48		**Response Text**
The lists of "major source areas" in Section 4 and the list of "potential major source areas" in Table 5.4-1 need to be coordinated. We recommend moving Table 5.4-1 to Section 4 and editing it to reflect the information presented in this chapter.				Table deleted and replaced with text narrative describing major source areas to be consistent with the FS.
1551	Draft	4.1	**3195**	
Comment Text		Tables 4.1-1 and 4.1-2		**Response Text**
These tables are based solely on the inventory prepared by BLM. While it is an excellent source of information and a good choice for the core inventory, other sources need to be added. In particular, the surficial geology analysis prepared by Box et al. (1999)				The BLM GIS coverage was selected as the base for identifying source areas in the RI. Further refinement of the floodplain source area boundaries are included in the FS and

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does not entire coincide with the BLM inventory, but is a very important source of information. New polygons should be created and added to those of the BLM source inventory.				will be an ongoing task as areas are identified for action and more data are gathered. No modifications necessary.
1552	Draft	5.4	3196	
Comment Text		p. 5-48		**Response Text**
Table 5.4-1 No justifications are offered to support the choice of these sites. As it is, we assume that these sites are selected solely on the basis of being situated in a load increase reach. This should be stated, and an overall explanation of the selection process should be added to the main text. The following comments address individual entries.				Table deleted and replaced with text narrative describing major source areas to be consistent with the FS.
1553	Draft	5.4	3197	
Comment Text		p. 5-48		**Response Text**
Table 5.4-1 Galena Mine and Millsite Complex: the Galena rock dumps and the tailings ponds, which are situated on Lake Creek downstream of the mine and millsite, should be listed as well.				Table deleted and replaced with text narrative describing major source areas to be consistent with the FS.
1554	Draft	5.4	3198	
Comment Text		p. 5-48		**Response Text**
Table 5.4-1 Hercules Millsite: A mill site existed there, and tailings are present, but no sample results are available.				Table deleted and replaced with text narrative describing major source areas to be consistent with the FS.
1555	Draft	5.4	3199	
Comment Text		p. 5-48		**Response Text**
Table 5.4-1 The Osburn Zanetti gravel operation, Osburn north tailings area, and Osburn Zanetti stockpiled tailings are part of the floodplain area where sediments are commingled with jig-era tailings (Box et al. 1999), and they should be added to the list of major sources.				Table deleted and replaced with text narrative describing major source areas to be consistent with the FS.
1556	Draft	5.4	3200	
Comment Text		p. 5-48		**Response Text**
Table 5.4-1 Silver Crescent Tailings (should read Silver Summit Tailings Pond): No sample results are available. We agree that this site is a credible candidate source, but we are not aware of any information specifically describing the site chemistry, quantities, conditions, etc. In addition, if this site is considered a major source, it is probable that the Silver Summit mine and millsite, situated immediately above, should be included.				Table deleted and replaced with text narrative describing major source areas to be consistent with the FS.
1557	Draft	5.4	3201	
Comment Text		p. 5-48		**Response Text**
Enterprise Mine: This site is extremely small and should be subsumed under the South Fork impacted floodplain area, which it adjoins directly. We also recommend adding the floodplain areas of sediment commingled with jig-era tailings, as mapped by Box et al. (1999) that fall outside the polygons identified by the BLM mine site inventory.				Table deleted and replaced with text narrative describing major source areas to be consistent with the FS.
1558	Draft	5.4	3202	
Comment Text		p. 5-48		**Response Text**
Bunker Hill Superfund Site: We agree that this is a major source area, in fact the most important in the Basin in terms of added load. However, it is not clear in this table which areas are covered by this designation, since the next four areas listed are normally also considered to be part of the Bunker Hill Superfund Site. This should be clarified.				Table deleted and replaced with text narrative describing major source areas to be consistent with the FS.

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Comment No.	Version	Subsection / Add'l Ref	Doc ID	
South Fork				
3-CSM Unit 2, Midgradient Watersheds				
1559	Draft	5.4	3203	
Comment Text		p. 5-48		**Response Text**
The South Fork impacted floodplain below Elizabeth Park is not identified as a potential major source. We recommend adding it to the list, particularly BLM polygons KLW090 (South Fork Coeur d'Alene river tailings deposition area) and KLW001 (South Fork Coeur d'Alene river below Pinehurst Narrows Dam), as well as the floodplain areas of sediment commingled with jig-era tailings, as mapped by Box et al. (1999) that fall outside the polygons identified by the BLM mine site inventory.				Table deleted and replaced with text narrative describing major source areas to be consistent with the FS.
Moon Creek				
2-CSM Unit 1, Upper Watersheds				
1463	Draft	2.3.2	3107	
Comment Text		Table 2.3.2-1		**Response Text**
[Previous comment 2/74.] Please indicate the typical values (= average for the entire period of record) of monthly precipitation and snowfall (by month) in the same table, to allow comparison with water year 1999.				Average monthly precipitation for period of record added.
1464	Draft	5.2.2	3108	
Comment Text		p. 5-4		**Response Text**
[Previous comment 2/87.] Last para: Since no TMDLs area available for this location, we recommend that the expected and observed concentrations be compared to the aquatic life water quality criteria.				Estimated expected values for concentration are compared with screening levels in the text and in the figures already. The screening levels for cadmium, lead, and zinc are the AWQC or established background values for the Basin.
1465	Draft	5.4	3109	
Comment Text		p. 5-7		**Response Text**
[Previous comment 2/92.] The expected value obtained from the probabilistic model is presented as an absolute value; a range (e.g., confidence interval) around this value would be more useful.				Coefficients of variation added to the modeling results summary in Table 5.2-1..
Nine Mile Creek				
2-CSM Unit 1, Upper Watersheds				
1466	Draft	2.1.7.2	3110	
Comment Text		p. 2-5		**Response Text**
2nd para: the Interstate (-Callahan) No. 4 adit is incorrectly identified as located in Segment NMSeg02, when it should be placed in NMSeg01.				The segment boundary between NMSeg01 and NMSeg02 places the Interstate No. 4 adit within NMSeg02
1467	Draft	2.1.7.2	3111	
Comment Text		p. 2-5		**Response Text**
2nd para, 1st sentence: The November 1997 and October 1998 flow information for the Interstate (-Callahan) No. 4 adit is incorrectly attributed to Ridolfi (1999). The November 1997 sampling was performed by URS as part of the RI work and the data are found in URS's TDMS database (URS Greiner 1999, 2000); we are not aware of any available results for this site in October 1998 (the reference may be to a URS sampling event in May 1998). Additional information collected by USGS is also found in Balistrieri et al. (1998).				The text has been corrected.
1468	Draft	2.1.7.2	3112	
Comment Text		p. 2-5, 2-6		**Response Text**
[Previous comment 2/151.] Additional and more recent flow information is found in Balistrieri et al. (1998) and in the TDMS				Additional flow data has been added.

Comment No.	Version	Subsection / Add'l Ref	Doc ID

Nine Mile Creek

2-CSM Unit 1, Upper Watersheds

database (URS 2000) for the Success No. 3 and Rex No. 2 adits.

1469 Draft — 2.2.1 — **3113**

Comment Text — p. 2-7

[Previous comment 2/154.] 1st para: It should be noted that these three wells are all located in and representative only of conditions in Segment 4 (NMSeg04).

Response Text

Text modified as per comment.

1470 Draft — 2.3.1 — **3114**

Comment Text — p. 2-16

Fig. 2.3.1-1 [Previous comment 2/160.] The figure should indicate that precipitation data are for Woodland Park.

Response Text

Figure has been modified.

1471 Draft — 3.0, 3.3 — **3115**

Comment Text — p. 3-1, 3-12

The sediment transport analyses, particularly the discussion of historic versus present analyses omitted the fact that over 400,000 cubic yards of material were removed from the channel and overbanks in the 1993 and 1994 construction seasons. These removals were followed with the construction of large rock groynes in the overbank that have been used to trap sediment. Because of phytotoxic effects, it has been difficult to revegetate the remaining channel resulting in a severely disturbed system. This seems to be reflected in the data, but not in the discussion of the results of the analyses. The 1999 sediment transport is "below average" for that period, because the period reflects pre- and post-construction conditions. This is an important limiting factor with respect to using these data for future planning and should be discussed.

Response Text

Text added.

1472 Draft — 3.2.1 — **3116**

Comment Text — p. 3-4

2nd para: There is a discussion of the use of Placer Creek gage data as it relates to the 1999 flow estimates for Ninemile Creek, with the statement that "the estimates for Ninemile Creek from Placer Creek overestimate the discharge by 45 percent for the peak discharge measured in water year 1999". This may not be the case, the difference in predicted flows using the Placer Creek gage may simply reflect the expedited peak flows resulting from the channel and overbank removal actions, and the lack of vegetation along the Ninemile Creek riparian zone. The Placer Creek gage represents a largely undisturbed watershed, and would be expected to reflect the flows occurring prior to the recent sediment removals. The observed increase in peak flow rates in the post removal channel falls with in the bounds of predictable hydrologic behavior. As such, it may be pertinent to look at whether it may be more appropriate to use the Placer Creek gage data to estimate the sediment transport for the Upper South Fork watershed, rather than the average of Canyon Creek and Ninemile Creek sediment rates, as was done in the analyses for that watershed.

Response Text

Placer Creek gage data were used to estimate historical discharges in Ninemile Creek. These estimates of historical discharge were used to estimate historical sediment transport. Adjustments for the removal of sediment in the channel were not made.

1473 Draft — 3.2.3 — **3117**

Comment Text — p. 3-7, 3-8

Figs. 3.2-10 to 3.2-13. Please provide a very careful review of the nomenclature used for mine sources in this section to match those used in the remainder of the RI and FS. The site identified as "Granite Mine" is now referred to as the Success Mine; Section 3 2.3.4 does not mention the riprap in the channel through this section of the creel; Section 3.2.3.3 does not mention the "Fish Pond" at the bottom of Segment 3. Section 3.2.3.3 also indicates that the Dayrock Tailings Dam is located near station 205+00 in Segment 3, which is actually the location indicated by the Mayflower Mine on the BLM source mapping; the tailings dam is located in Segment 4 east of the creek and road at about 160+00. Please correct both the figures and text of this section so that the major source areas identified in Sections 4 and 5 of the Ninemile Creek watershed are correctly shown and discussed.

Response Text

Source names on figures 3.2-10 through 3 2-13 updated. Channel descriptions were based on aerial photograph review, although the section described in section 3.2.3.4 may be riprapped, the scale of the photographs reviewed does not provide enough detail to distinguish these features. Text was added to section 3 2.3 3 to identify the "Fish Pond" area. Text in section 3.2.3.3 was changed to indicate the area previously identified as Dayrock Tailings Dam as the Mayflower Mine.

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Nine Mile Creek				
2-CSM Unit 1, Upper Watersheds				
1474	Draft	3.2.3.4	3118	
Comment Text		p. 3-11		**Response Text**
We believe that Blackcloud Creek does not appear in the aerial photos because Blackcloud Creek enters Ninemile Creek in a restricted channel and culvert that passes beneath the community of Blackcloud. The creek is not ephemeral and has been sampled during the fall in an exposed channel on the west side of the county road.				Text added.
1475	Draft	4.1, 4.5	3119	
Comment Text		p. 4-7		**Response Text**
1st and 2nd para, two instances: Suggest rewording: at least one sampling location each"				Text modified as per comment.
1476	Draft	4.2.2.1	3120	
Comment Text		p. 4-9		**Response Text**
3rd para, 3rd (last) line: "non-discrete sources" – nebulous expression. If commingled riparian sediment, mass wasting, or exchanges with ground water are believed to be important sources of loading in this reach, this should be stated clearly.				Text modified as per comment.
1477	Draft	4.2.2.2	3121	
Comment Text		p. 4-10		**Response Text**
1st para, 4th line: Capitalize – "the Interstate rock dumps…"				Text modified as per comment.
1478	Draft	5.1, 5.2	3122	
Comment Text				**Response Text**
Until now, segments have been referred to by their CSM designation (NMSeg01 through NMSeg04); in these sections, they are referred to as Segments 1 through 4. We suggest systematically using the CSM segments designations for consistency.				Text modified as per comment.
1479	Draft	5.4	3123	
Comment Text		p. 5-14		**Response Text**
1st para, 2nd line: Since the acronym "PDFs" for "probability density functions" is not used in the rest of the Ninemile Creek section, it's not useful to include it at the very end. Delete.				Text modified as per comment.
1480	Draft	5.4	3124	
Comment Text		p. 5-47		**Response Text**
Table 5.4-1 Several of the sources listed here are not mentioned in sections 4 1.2.7 and 4.1.4.7 where the major source areas for these segments are discussed.				Table 5.4-1 edited to match section 4.1 lists of major source areas and the source areas identified in the FS.Text added to present selection criteria.
1481	Draft	4.1.2.7, 4.1.4.7, 5.4	3125	
Comment Text		p. 4-5, 4-7, 5-47		**Response Text**
Table 5.4-1 The lists of "major source areas" in Section 4 and the list of "potential major source areas" in Table 5.4-1 need to be coordinated. We recommend moving Table 5.4-1 to Section 4 and editing it to reflect the information presented in this chapter.				See response to comment No. 1480.
1482	Draft	4.1, 5.4	3126	
Comment Text		Tables 4.1-1 thru 4.1-4, 5.4-1		**Response Text**
These tables do not offer the information that would be needed in the FS, in particular quantity estimates, volumes, depths, and other information on the extent of the primary identified sources.				To reduce the overall size of the RI/FS, volume estimates, depths and other source area specific information is included in the FS.

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Nine Mile Creek				
2-CSM Unit 1, Upper Watersheds				
1483	Draft	4.1	3127	
Comment Text		Tables 4.1-1 thru 4.1-4		**Response Text**
These tables are based solely on the inventory prepared by BLM. While it is an excellent source of information and a good choice for the core inventory, other sources need to be added. In particular, the surficial geology analysis prepared by Box et al. (1999) does not entire coincide with the BLM inventory, but is a very important source of information. New polygons should be created and added to those of the BLM source inventory.				The BLM GIS coverage was selected as the base for identifying source areas in the RI. Further refinement of the floodplain source area boundaries are included in the FS and will be an ongoing task as areas are identified for action and more data are gathered. No modifications necessary.
1484	Draft	5.4	3128	
Comment Text		p. 5-47		**Response Text**
Table 5.4-1 No justifications are offered to support the choice of these sites. As it is, we assume that these sites are selected solely on the basis of being situated in a load increase reach. The reason for their selection should be stated, and an overall explanation of the selection process should be added to the main text. The following comments address individual entries.				Table 5.4-1 edited to match section 4.1 lists of major source areas and the source areas identified in the FS.Text added to present selection criteria.
1485	Draft	5.4	3129	
Comment Text		p. 5-47		**Response Text**
Table 5.4-1 Tamarack Complex: We agree that this is a probable major source based on the quantities of mine waste present; however, very little sampling was done or reported. This site should be remedied.				Comment noted. The Tamarack Complex is included on the list of sites identified in the FS for cleanup actions.
1486	Draft	5.4	3130	
Comment Text		p. 5-47		**Response Text**
Table 5.4-1 The American Mine and Alameda Mine sites are subsumed under the Success site, it is not logical to treat them as separate entities.				Text modified to indicate that the Alameda Mine is included in the Success site. Table 5.4-1 edited to match section 4.1 lists of major source areas and the source areas identified in the FS.Text added to present selection criteria.
1487	Draft	5.4	3131	
Comment Text		p. 5-47		**Response Text**
Table 5.4-1 The Dayrock Repository should be mentioned explicitly to match the text of Section 4 1.4.7.				Table 5.4-1 edited to match section 4.1 lists of major source areas and the source areas identified in the FS.Text added to present selection criteria.
1488	Draft	5.4	3132	
Comment Text		p. 5-47		**Response Text**
Table 5.4-1 Panhandle Mine: No samples reported; the description in Table 4.1-4 says "Upland waste rock." This site could be listed along with the Dayrock mine, tailings pile, and repository since it is immediately adjoining. We have found no information suggesting that it deserves to be considered a major source.				Table 5.4-1 edited to match section 4.1 lists of major source areas and the source areas identified in the FS.Text added to present selection criteria.
1489	Draft	5.4	3133	
Comment Text		p. 5-47		**Response Text**
Table 5.4-1 Option Mine: No samples reported; the description in Table 4.1-4 says "Upland waste rock, erosion potential." We have found no information suggesting that it deserves to be considered a major source.				Table 5.4-1 edited to match section 4.1 lists of major source areas and the source areas identified in the FS.Text added to present selection criteria.
1490	Draft	5.4	3134	
Comment Text		p. 5-47		**Response Text**
Table 5.4-1 Backcloud millsite: A mill site existed there, and tailings are present, but no sample results are available.				Table 5.4-1 edited to match section 4.1 lists of major source areas and the source areas identified in the FS.Text added to present selection criteria.

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Nine Mile Creek				
2-CSM Unit 1, Upper Watersheds				
1491	Draft	5.4	3135	
Comment Text		p. 5-47		**Response Text**
Table 5.4-1 Silver Star Mine: the adit drainage has low flow and low lead and zinc concentrations (one sample), no soil sample reported; the description in Table 4.1-4 says "Upland waste rock." We have found no information suggesting that it deserves to be considered a major source.				Table 5.4-1 edited to match section 4.1 lists of major source areas and the source areas identified in the FS.Text added to present selection criteria.
1492	Draft	5.4	3136	
Comment Text		P. 5-47		**Response Text**
Table 5.4-1 Northside Mine: No samples reported; the description in Table 4.1-4 says "Upland waste rock, erosion potential." We have found no information suggesting that it deserves to be considered a major source.				Table 5.4-1 edited to match section 4.1 lists of major source areas and the source areas identified in the FS.Text added to present selection criteria.
1493	Draft	5.4	3137	
Comment Text		p. 5-47		**Response Text**
Table 5.4-1 Sierra Silver Mine: No samples reported; the description in Table 4.1-4 says "Upland waste rock." We have found no information suggesting that it deserves to be considered a major source.				Table 5.4-1 edited to match section 4.1 lists of major source areas and the source areas identified in the FS.Text added to present selection criteria.
1494	Draft	5.4	3138	
Comment Text		p. 5-47		**Response Text**
Table 5.4-1 Since some upland sites are listed, other upland sites such as the Sunset Mine should be included. Adit drainage samples from this site (Sunset Tunnel) show very high metal concentrations (listed in TDMS database and cited in Gearheart et al , 1999).				Table 5.4-1 edited to match section 4.1 lists of major source areas and the source areas identified in the FS.Text added to present selection criteria.
1495	Draft	5.4	3139	
Comment Text		p. 5-47		**Response Text**
Table 5.4-1 Ninemile Creek and EF Ninemile Creek impacted riparian zones should also be listed as probable major sources areas, as the sampling results (shown in Tables 4.1-1, 4.1-2, and 4.1-4) show high surface soil, sediment, and ground water metal concentrations.				Table 5.4-1 edited to match section 4.1 lists of major source areas and the source areas identified in the FS.Text added to present selection criteria.
*** No Watershed ***				
0-Comment Pertaining to Entire Document				
1357	Draft		31	
Comment Text				**Response Text**
Previous Comments: References to previous comments have been indicated as follows: Comments on Parts 2 through 4, sent 09/15/2000, were renumbered G/1 through G/10 (general comments), 2/11 through 2/161 (comments on Part 2), 3-4/162 through 3-4/166 (general comments applicable to Parts 3 and 4), 4/167 through 4/234 (comments on Part 4), and 3/265 through 3/301 (comments on Part 3). Many comments have been modified or rephrased to reflect recent changes.				Comment noted.
1358	Draft		32	
Comment Text				**Response Text**
[Previous comment G/2.] Coordination and Consistence: Information in different sections for a given area, especially between sections describing the Physical Setting (2.0) and the Nature and Extent of Contamination (4.0), are not always well coordinated. A dedicated revision effort should be devoted to coordinating these sections. The results presented in each section, particularly Sediment Transport Processes (3.0), Nature and Extent of Contamination (4.0), and Fate and Transport (5.0), should be summed up				The RI is structured as a data report on available information. The detailed analysis of the technical information is included in the Feasibility Study.

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either at the beginning or the end of each chapter.

1359 Draft — **33**

Comment Text

[Previous comment G/4.] Figures and Visual Support: Physical features described in the text should be shown on a figure. Some references are made to figures in Part 1 (e.g., 1.2-2, 3.2-1, 3.2-2) which do not show the level of detail needed. Similarly, complex phenomena such as those described for the lake fate and transport processes in CSM 4 would benefit from being illustrated with schematics.

Response Text

Details referenced in text added to Figures 1,2-2, 3 2-1, and 3.2-2.

1360 Draft — **34**

Comment Text

[Previous comment G/7.] Precision of Estimates: The use of single numbers for values to which a significant level of uncertainty is attached (e.g., means obtained from synthetic hydrographs, annual sediment loads), or which are known to fluctuate over a range (e.g., annual cycle of stream discharges and contaminant concentrations and loads), should be replaced by the use of ranges or brackets. In addition, significant digits should be limited to one or two for most estimates; five and six digits numbers are misleading (e.g., "Approximately 51,080 tons of sediment was transported past the USGS gage station at Harrison during the water year 1999.") Finally, estimates to which a large alpha value (significance level) is attached, e.g., 0.15 and greater, should be carefully qualified since there is an important possibility (i e , 15% or greater) that the results have been obtained purely due to chance.

Response Text

Text modified as per comment.

1361 Draft — **35**

Comment Text

[Previous comment G/9.] SFCDR in the Box: The South Fork Coeur d'Alene River was explicitly excluded from the 1992 ROD, and therefore should be explicitly included in the basin-wide RI/FS. The revised text now mentions that even using mean or "expected" values rather than peaks, the reach from Elizabeth Park to Pinehurst contributes approximately 55% to 65% of the contaminant load in the SFCDR at Pinehurst (SF271). However, it does not stress that this load is likely to remain substantial even after the current remediation work at the Box and should therefore be addressed as part of the current RI/FS work.

Response Text

Loading from the Box is addressed in the Fate and Transport section of the South Fork report. As EPA proceeds with the Box and Basin remedy, efforts will be coordinated.

1362 Draft — **36**

Comment Text

[Previous comment G/10.] Lower Coeur d'Alene River: We recommend that A. Bookstrom of USGS be asked to peer review Part 4 (CSM 3: Lower Coeur d'Alene River) of the RI.

Response Text

A. Bookstrom comments have been received.

1363 Draft — **37**

Comment Text

[Previous comment 1/5.] USGS RI Work: From section to section of the RI, the USGS RI work is unevenly included and understood. Given the amount or work (and money) involved, we feel a special effort should be made to merge the USGS and URS information. This point was much improved in Part 1, but not in Parts 4 and 5 in particular.

Response Text

The CDA Lake report reorganized to integrate EPA and USGS studies.

1364 Draft — **38**

Comment Text

Nature and Extent / Definition of source areas: Section 3.4 of the EPA Guidance for conducting RI/FS that addresses Data Analyses indicates: "Analyses of the data collected should focus on the development or refinement of the conceptual site model by presenting and analyzing data on source characteristics, the nature and extent of contamination, the contaminant transport pathways and fate,

Response Text

EPA believes that the more than 10,000 samples collected to support the RI/FS, combined with more than 7,000 samples collected independently by IDEQ, USGS, the mining companies, and EPA under other regulatory programs (e.g., NPDES), provide a

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and the effects on Human Health and the environment. Data analyses is complete when the DQOs that were developed in scoping (including any revisions during the RI) are met, when the need (or lack thereof) for remedial actions is documented, and when the data necessary for the development and evaluation of remedial alternatives have been obtained". This process is not complete with respect to providing sufficient data to support the alternative development and evaluation in the FS. In many instances in the RI, the sources are just listed in the text or table with the polygon area from the BLM database; in some instances they are not listed; and in others, those listed with sample data were excluded because they had not been previously been defined in the BLM GIS coverage (see specific comments below). While there are numerous sources present in the watershed, and it is recognized that given the time constraints it would be very difficult to fully characterize every polygon, there should be volume, depth, and other information on the extent of the primary identified sources to support the alternatives development and evaluation in the FS. In addition, it is suggested that coordination with the FS be performed regarding the definition of the primary sources. It is not certain that these two documents are focussed on the same primary sources (see specific comments below).

solid basis to support informed risk management decisions for the Coeur d'Alene basin mining contamination.

The RI lists of major source areas has been revised for consistency with the FS.

1365 Draft **39**

Comment Text

Screening Levels: The upper background concentrations for highly mineralized areas of the South Fork basin are not appropriate screening levels for surface waters, soil, or sediments in CSM Units 3, 4, or 5. It is noted in the Draft Ecological Risk Assessment that the "true background conditions" in these areas "are considerably lower than the selected values." Risk-based concentrations should be used unless/until appropriate background concentrations are developed for these CSM units.

Response Text

Background concentrations have been revised and are reported under separate cover in a Technical Memorandum (May 2001). The draft text to which this comment refers has been replaced.

1366 Draft **310**

Comment Text

Ecological Information: Section 3 2 of the EPA Guidance for Conducting RI/FS (EPA 1988) indicates that there are several elements of ecological information that typically are provided in an RI. These are: ecosystem components and characteristics, critical habitat, and biocontamination. While it is likely that these components are discussed in the Ecological Risk assessment, a summary of this information should be included into the RI.

Response Text

Comment noted. Summaries of ecological conditions for each watershed are included in Part 1 and not in the individual reports in order to minimize report size.

1367 Draft **311**

Comment Text

Recent Actions: While text concerning recent actions in the watersheds has been added, it has been added to the initial section of the report, prior to the description of key features of the watershed. It might be easier to understand the context of what has been performed if this text was placed (or at least summed up) after the description of the watershed, or even following Section 2.2 that discusses the mining history of the watershed. As it is, the discussion jumps from macro-scale (watershed) to micro- (specific actions in specific locations that haven't been introduced yet), and back to macro- (description of watershed).

Response Text

To limit the length of the combined documents, a summary of cleanup actions in each watershed was included in Part 1 and not repeated in each of the watershed reports. No text changes made.

1368 Draft **312**

Comment Text

Sediment Transport: The sediment transport analyses that have been performed have been based upon a "statistical" calculation of an average annual flow, from one year's data. This work, and the text discussing the sediment transport mechanisms, largely ignores the previous work performed by McBain and Trush for USGS in establishing flow thresholds for sediment transport (McBain and Trush 2000). These thresholds are also statistically based, but result in looking at a range of sediment transport values to follow the range in expected flows. The important issue here is that the flow used for this analysis was apparently based upon mean daily flow conditions, rather than the flood events that typically are more critical to moving large volumes of sediment. As an example, for Ninemile Creek, a mean average flowrate of 133 cfs was apparently used for the analyses; the threshold flows for

Response Text

The work of McBain and Trush is discussed in the watershed reports for the analyses provided by McBain and Trush, for example, Canyon Creek. The use of mean daily discharge may underestimate the sediment transport quantity at flow peaks; however, it does account for fluctuations in discharge over time. The method used is a standard accepted procedure by the USACE.

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sediment transport were defined as closer to the one year storm (below bankfull flow) or around 80 cfs. The calculated 100-year storm event (about 800 cfs) is about 10X greater than the one year storm. As such, this method grossly underestimates the potential for sediment transport. It may be more prudent to look at the relationship between bedload and probability of the storm event associated with its entrainment.

1369 Draft — **313**

Comment Text

Contaminant transport with respect to sediment: There is no tie between the sediment transport and contaminant transport analyses. While the text acknowledges sediment sample results in the upper basin that indicate elevated concentrations of metals such as lead, the contaminant transport model for the upper basin (CSM 1 and 2) focuses on dissolved constituents in the surface water, and largely ignores the contaminants in the particulate load represented by the bedload. However, somehow, by CSM3, there are some 50,000 tons per year of lead-contaminated sediment. This pathway has been dismissed as a significant contaminant pathway from the upper basin without the investigation to support that dismissal; this leads to an incomplete pathway definition for particulate lead from the upper basin to the lower basin of the CdAR watershed.

Response Text

Surface water and sediment have been clearly identified throughout the RI as being the significant transport pathways (See Part 1 Section 2 on the CSM). Following standard practices to evaluate risks, surface water and sediment samples were collected and analyzed for metals. Results were initially compared to risk-based screening criteria (as presented in the RI), followed by detailed risk analyses in the HHRA and EcoRA.

Though it may have added slightly more detail to the sediment transport sections if the limited number of suspended and bedload sediment samples collected by the USGS had also been analyzed for metals, sediment core data available for the Lower Basin clearly indicate that sediment containing metals concentrations much greater than background have been deposited in this area over the last 100 years.

1370 Draft — **314**

Comment Text

Channel Classifications: A Rosgen level 1 channel classification has been provided for most channel segments of the watershed. There are several cautions related to this analysis: 1) It does not apparently include a review of sinuosity, or meander width ratio, but was solely based upon slope and photographic records of stream condition and cover (this review might alter the final classifications; however, these classifications have received a proper caveat as being preliminary); 2) while typically not included into a level 1 classification, the definition of bankfull-flow is important to the development of alternatives in the FS; there are sufficient data provided in the hydrology and sediment transport sections of the report to support this; and 3) some level of ground-truthing should have been provided: there are Rosgen classifications and discussions of bank stability for portions of several channels that have been constructed to an engineered trapezoidal channel and rip-rapped with rock. The approach taken in Appendix E of the FS may be more appropriate; the RI should at least coordinate with the FS on this issue.

Response Text

Comment noted. The classifications provided are based on map and photo interpretation. This level of analysis is intended to provide general information concerning channel types. If more detailed classification is found to be useful, for specific locations in the watershed, additional effort including fieldwork should be accomplished.

1371 Draft — 1.0, 1.1, 1.2 — **315**

Comment Text

Report Organization: It would be very helpful to place the report organization information at the very beginning of the report, or at least a sentence relative to where the particular watershed report fits in the big picture. This would be particularly helpful for the watersheds such as the Main Stem of the CdAR, where the report covers only one segment of the CSM Unit.

Response Text

Text added to Part 1, Section 1.4 to show which watersheds are included in which CSM Unit.

1372 Draft — 2.3 — **316**

Comment Text

Surface Water Hydrology: Please provide a summary table of flow rates that can be used to develop and evaluate the alternatives in the FS; this table should include from mean low and high base flows, bankfull flow (about 1.5-year frequency) and the 100-year flood flows.

Response Text

Estimates of the 1.5 year discharge event have been made and are now included in the text; estimates of base flow are also included in the text.

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1373	Draft	3.2	317	
Comment Text				**Response Text**
Channel Classification, Channel Description and Associated Figures: Please make sure that the mine sites cited in the discussion of stream characteristics are reflected in the associated figures. Please confirm that the primary sources indicated in the stream drawings are also the primary sources identified in Sections 4 and 5 of the RI. Also, please confirm mine site names and locations from these exhibits with the other source figures of the RI and FS documents – some of the sources (particularly on Ninemile Creek exhibits) are critically mislabeled.				Text modified as per comment.
1374	Draft	3.3	318	
Comment Text				**Response Text**
Recommendations for Channel Restoration (in Summary of Channel Descriptions): It may not be appropriate to recommend channel restoration measures in this section, or in the RI; we generally agree with the suggestions, but would suggest coordination with FS counterpart to make sure appropriate measures are included into the alternatives for each watershed.				Restoration recommendations are beyond the scope of the RI document.
1375	Draft	4.2	319	
Comment Text				**Response Text**
Total Mass Loading Maps: We believe these maps to be important; however, they are very busy and therefore difficult to read. Suggest just showing the pertinent watershed, and perhaps the sample location immediately downgradient of the watershed in the report (as an example, the Upper South Fork figure shows only seven stations actually situated in the Upper South Fork, and the remaining 21 stations that are downstream on the South Fork to Pinehurst.) In addition, these maps should be very clearly labeled to reflect that they reflect either high or low water sample conditions – this is particularly important for lead.				The mass loading maps contained this amount of information specifically to show changes in load contributions all along the South Fork. Though busy, the intended message is given. No changes necessary.
1376	Draft	4.2.1.2	320	
Comment Text				**Response Text**
[Previous comment 2/124.] Degree of Correlation: define what threshold values (or approximate ranges, as the case may be) were used to classify contaminants as "highly," "well," "reasonably," "somewhat," "marginally," and "not well" correlated. For example, it's not clear why an "r" value of 0.15 is "marginally correlated" while a value of 0.12 is "not significantly correlated."				Highly: $r > 0.9$ Well: $0.7 < r < 0.9$ Reasonably well: $0.6 < r < 0.7$ Reasonably: $0.5 < r < 0.6$ Somewhat: $0.3 < r < 0.5$ Marginally: $0.1 < r < 0.3$ Not: $r < 0.1$ Text in Part 2, Canyon Creek, Section 4.2.1 modified to reflect these ranges.
1377	Draft	5.2.2.2	321	
Comment Text				**Response Text**
Total Mass Loading: The mass loading as such does not include the entrainment of greater particles of sediment containing lead and zinc that would occur at higher flow rates. These analyses are based upon an average annual flow and thus most likely under-represent the total quantities of metals being entrained into the water column at higher flow events.				This method may underestimate the concentrations and loads that may occur during high flow rates; however, the estimated (average) concentrations and loads are significantly greater than AWQC and TMDLs (in many locations greater than 100 x) which is the point being made in these sections.
1378	Draft		322	
Comment Text		Attachment 2		**Response Text**
[Previous comments 2/32, 2/138, 4/234, 5/264, and 3/301.] No sample that has received a "U" as data qualifier (= undetected)				Tables reformatted to remove exceedence indicators for non-detect results.

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should be boxed as if it exceeds the screening level.				
1379	Draft		323	
Comment Text				**Response Text**
References to "Ridolfi 1999" should be corrected for "Gearheart et al. 1999" (full reference is listed at the end of this review form).				Text modified as per comment.
1758	Draft		81	
Comment Text				**Response Text**
Previous Comments: References to previous comments have been indicated as follows: Comments on Part 1, sent 8/28/2000 were renumbered 1/1 through 1/6; comments on Part 5, sent 9/15/2000, were renumbered 5/235 though 5/264; comments on Part 7, sent 9/28/2000, were renumbered 7/1 through 7/70. Many comments have been modified or rephrased to reflect recent changes.				Comment noted.
1759	Draft	1.0, 1.1, 1.2	82	
Comment Text				**Response Text**
Report Organization: It would be very helpful to place the report organization information at the very beginning of the report, or at least a sentence relative to where the particular watershed report fits in the big picture. This would be particularly helpful for the watersheds such as the Main Stem of the CdAR, where the report covers only one segment of the CSM Unit.				Text added to Part 1, Section 1.4 to show which watersheds are included in which CSM Unit.
1823	Draft	5.3.2.5.1, 5.3.2.5.2	866	
Comment Text		Page 5-19		**Response Text**
In both cases (Fall 1997 and Spring 1998), the URS data were collected during a period of declining stream discharges and "could result in higher estimated downstream contributions to loading relative to upstream contributions than actually exists." Was this potential for overestimate at certain locations taken into account in any way in the evaluation of chemical mass loading?				Yes. Because of the inherent variability of the system, available surface water data from 1991 through 1999 were pooled for individual locations and discharge, concentration, and mass loading estimated averages were calculated using the probabilistic modeling.
1-Setting and Methodology				
1760	Draft	1.1	83	
Comment Text		Page 1-2		**Response Text**
Para. 2, last sentence: To meet water quality objectives in the South Fork, further actions within the basin beyond and within the BHSS will be needed. This has been recognized by EPA. As examples, Bunker Hill mine water treatment has been evaluated and groundwater interactions with underlying tailings have not been explicitly addressed or corrected since the development of the RODs. Also, as discussed in Section 2.3.2 on page 2-12, the ROD for the BHSS "does not address the SFCDR."				Loading from the Box is addressed in the Fate and Transport section of the South Fork report. As EPA proceeds with the Box and Basin remedy, efforts will be coordinated.
1761	Draft	1.1	84	
Comment Text		Page 1-2		**Response Text**
3rd para, first sentence: Broader threats from mining contamination in the basin were indicated prior to completion of the BHSS RODs.				Text modified to include information.
1762	Draft	1.2.1	85	
Comment Text		Page 1-4		**Response Text**
Next to last sentence, suggest the following revision: "Since the onset of mining, natural processes have transported and continue to transport large volumes of metal contaminated sediment down the river system, depositing the metals in floodplains, the lateral lakes, Coeur d'Alene Lake, and the Spokane River."				Text modified as per comment.

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1763	Draft	1.2.2	86	
Comment Text		Page 1-4		**Response Text**
Suggest the following edit in the second sentence: "…discovery of lead and silver in 1884."				The paragraph has been modified to reflect the early mineral discoveries in the basin.
1764	Draft	1.2.2	87	
Comment Text		Page 1-4		**Response Text**
Some of the quoted material from Stratus (1999) (Draft Report of Injury Assessment) has been revised in the subsequent version (Stratus 2000, Report of Injury Assessment and Injury Determination). Please update the quoted material.				Reference and text updated.
1765	Draft	1.2.2	88	
Comment Text		Page 1-5		**Response Text**
Citation after 1st para: The information included from Stratus (1999) is not entirely accurate. The early gravity concentrators produced both coarse (jig) tailings and fine (slimes) tailings. The latter were mostly carried downstream, leaving the former behind. Please consult expert reports by Quivik (1999) and Bull (1999) for a more accurate depiction of character of gravity and flotation tailings.				The text from Stratus 2000 gives the most comprehensive summary of this process and has been kept in as orginally published.
1766	Draft	1.2.2	89	
Comment Text		Page 1-6		**Response Text**
Suggest the following revision of the 2nd sentence in 2nd para: "This effort resulted in the production of additional flotation tailings. Although these tailings contained less zinc than the jig tailings, their finer grain size allowed more rapid dispersion of the remaining zinc into ecosystem."				The comment has been incorporated into the text
1767	Draft	1.2.2	810	
Comment Text		Page 1-6		**Response Text**
Correction in last para, 4th sentence: "…are expected to reduce releases…"				Text modified as per comment.
1768	Draft	1.2.4.5	811	
Comment Text		Page 1-9		**Response Text**
3rd para: In this context, "Day Rock Repository" should be "Day Rock tailings impoundment." The impoundment became a repository only with the addition of the materials removed from Ninemile Creek.				Text modified as per comment.
1769	Draft	1.2.4.7	812	
Comment Text		Page 1-11		**Response Text**
1st para correction: "…development of an engineering evaluation and cost analysis…"				Text modified as per comment.
1770	Draft	1.2.4.11	813	
Comment Text		Page 1-14		**Response Text**
The 2nd para belongs in Section 1.2.4.9 as it discusses removals within the reach between Wallace and Pinehurst.				The paragraph has been deleted; the discussion in Section 1.2.4.9 applies to actions on the South Fork outside of the Bunker Hill site.
1771	Draft	1.2.4.13	814	
Comment Text		Page 1-16		**Response Text**
1st para: The measures described in the Coeur d'Alene Lake Management Plan have not been implemented. (These active measures must be supported and/or encouraged by EPA as a component of an overall basin cleanup plan.)				EPA is not in a position to implement the Lake Management Plan. EPA's role through the CERCLA process is to address hazardous substances. The Lake Management Plan was developed to control input of nutrients to the Lake. EPA recognizes the

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				importance of the Lake Management Plan and supports work by others on its implementation.
1772	Draft	Fig. 1.2-1	815	
Comment Text				**Response Text**
"Woodland Park" is incorrectly located on the map.				The figure has been corrected.
1773	Draft	2.1	816	
Comment Text		Page 2-3		**Response Text**
Correction in last line of page: "nature and ex tent of contamination" should be "nature and extent of contamination."				Text modified as per comment.
1774	Draft	2.2	817	
Comment Text		Page 2-4		**Response Text**
1st para, last sentence: It is unclear what creek within the BHSS the RI is referring to here – Bunker Creek or Government Gulch or some other tributary? Please clarify, as it is pertinent to the FS and to meeting water quality objectives in the South Fork.				Text modified to delete refrence to a creek within the BHSS.
1775	Draft	2.2	818	
Comment Text		Page 2-4		**Response Text**
1st para, last line, specify the creek: "…(with the possible exception of the creek within the Bunker Hill Superfund Site)."				Text modified as per comment.
1776	Draft	2.2.3	819	
Comment Text		Page 2-7		**Response Text**
3rd para, 2nd sentence: "but narrow above the confluence" should be "but narrows above the confluence."				Text modified as per comment.
1777	Draft	2.2.3	820	
Comment Text		Page 2-7		**Response Text**
2nd and 3rd paras: the text indirectly implies that metals oncentrations are higher in Segment 4 ("…(sometimes greater than 100-fold)…") than Segment 5 ("…by up to ten-fold, or more…"). The sentence in the 3rd para should be modified to reflect that metals concentrations are greater in Segment 5 than Segment 4.				Text modified as per comment.
1778	Draft	2.2.4	821	
Comment Text		Page 2-8		**Response Text**
2nd para: Recent data collected by the USFS for Moon Creek indicates improvements in post-reclamation water quality.				Text modified as per comment.
1779	Draft	2.2.5	822	
Comment Text		Page 2-8		**Response Text**
The RI states in the 1st para: "It is not known if location NM291 is affected by the tailings and other waste material at the Interstate mill site, but important source areas upstream of the Interstate mill site have not been indicated." NM291 is well above the mill site; water quality impacts at this location are likely related to waste rock accumulations upstream at the Interstate mine site. This potential source should be acknowledged.				Text corrected to reference the Interstate "mine" and not the "mill".
1780	Draft	2.2.8	823	
Comment Text		Page 2-10		**Response Text**
This section should also acknowledge that certain tributaries to the Upper South Fork significantly exceed ambient water quality criteria.				Text modified as per comment.

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1781	Draft	2.3.2	824	
Comment Text		Page 2-12		**Response Text**
[Previous comment 1/4.] The river was explicitly excluded from the 1992 ROD, and therefore should be explicitly included in the basin-wide RI/FS. The wording of this section is somewhat improved in the revised text, but still vague and evasive.				Text modified in Section 1 to clarify that the SFCDR that runs through the BHSS is evaluated in this RI.
1782	Draft	2.5	825	
Comment Text		Page 2-15		**Response Text**
In the 1st para the RI states "Clean material was used to build the levies for the railroad but contaminated material was used for the ballast into which the railroad tracks were laid." Recent testing shows high lead levels in the stratum 30 inches to 36 inches below the top of the railbed, well below ballast. Additionally, ballast appears to be basalt in some areas, and has an appearance similar to mine waste at other locations.				The UPRR cleanup actions to date have addressed the railroad grade ballast and the most highly contaminated concentrates as described in the EE/CA (MFG 1999). If in the future additional data become available and new risks are identified, appropriate actions will be taken.
1783	Draft	2.5	826	
Comment Text		Page 2-15		**Response Text**
1st para, last sentence: Please see Appendix C of Gearheart et. al 1998 for an estimate by Bookstrom of contaminated sediment in the delta of the Coeur d'Alene River. 2nd para, last sentence: Much development, along with associated nutrient inputs, is occurring around the lake now. Was this current condition taken into account? Please provide a basis or citation for the statement on the understanding "that the lake has substantial capacity to receive increased nutrients".				Text updated to include current estimate from A. Bookstrom at the USGS (3.0 million cy). Current USGS data for Coeur d'Alene Lake is included in the RI. Text on nutrient loading capacity of the lake deleted.
1784	Draft	2.6	827	
Comment Text		Page 2-18		**Response Text**
3rd full para: This indicates metals toxicity may cause mortality of trout. How does this effect the fish productivity and growth discussion presented on page 3-50 last paragraph?				Text on page 2-18 has been expanded to make it more complete, and text on page 3-50 has been revised to make it consistent with page 2-18. The main change on page 2-18 is addition of the following insert after the sentence that begins with "However, mortality studies . . ": "Other mortality was attributed to post-spawning adult mortality, high zinc concentrations, elevated summer temperatures, and/or low summer flows." These two sentences are added to the discussion on page 3-50.
1785	Draft	2.6.2	828	
Comment Text		Page 2-19		**Response Text**
1st para: Could these backwater areas behind the dams be filled with fine-grained metals-contaminated sediment? If so, what are the implications as relevant to the FS development?				These areas will be considered during remedy selection. They are currently not included as a focus of the FS.
1786	Draft	3.1.4	829	
Comment Text		Page 3-4		**Response Text**
The first citation on page 3-4 should probably be "NWS 2000c" and not "NWS 2000a."				Text modified as per comment.
1787	Draft	3.2.1.2, 3.2.1.3	830	
Comment Text		Page 3-6		**Response Text**
Unlike the previous section (3.2.1.1) discussing CSM 1 and CSM 2, these sections contain no mention of the anthropogenic				The transport of tailings from CSM1 and 2 into CSMs 3, 4 and 5 is discussed in the 3rd

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modifications to surficial geology of the system, particularly through transport of tailings-contaminated sediment by fluvial processes.				paragraph of section 3.2.1.1
1788	Draft	3.2.3	831	
Comment Text		Page 3-7		**Response Text**
Suggest the following modification to 1st sentence, para 3: "In the Coeur d'Alene District, the Belt Supergroup has been divided into six formations…" Stratigraphic nomenclature varies over the regional extent of the Belt Supergroup.				Text modified as per comment.
1789	Draft	3.2.3.1.1	832	
Comment Text		Page 3-8		**Response Text**
The fine-grained pyrite that is ubiquitous in the Prichard is not typically oxidized. The characteristic iron staining of Prichard outcrops is a feature of surface and near surface weathering. Fresh pyrite is readily visible in Prichard waste rock.				Text modified as per comment.
1790	Draft	3.2.6.1	833	
Comment Text		Page 3-14		**Response Text**
Suggest the following rewrite of this section, based on more current information: "Different interpretations of the age and formation of the ore deposits in the district have been proposed over the years. The age of vein emplacement has been variously hypothesized as being as old as Precambrian to as young as Cretaceous; similarly, hypotheses of the sources of metals in the veins have included intrusive magmas, a deep subcrustal source, and the Belt sediments (White 1998). The most current thinking, as summarized by White (1998) places the age of the veins as Late Cretaceous, a metals origin involving metamorphism of the sediments, and an association with the intrusion of the Idaho batholith."				Text modified as per comment.
1791	Draft	3.2.6.2	834	
Comment Text		Page 3-14		**Response Text**
Please use more current information for this section. It may be useful to summarize both pre-1968 production (before tailings containment) and total production to date. Suggest the following edits to the last two sentences: "The ore deposits are clustered in west-northwest- to northwest-trending areas called mineral belts, which are structurally controlled linear zones features defined by veins that occupy faults and fractures. Most of the silver dominant ores comes from the Silver Belt, an eastern subbelt eastern part of the Page-Galena Belt, known as the Silver Belt (Figure 3.2-3)."				Text modified as per comment.
1792	Draft	3.2.6.3	835	
Comment Text		Page 3-14		**Response Text**
1st para, the following edit is needed: "…sphalerite, (zinc sulfide [ZnS])…."				Text modified as per comment.
1793	Draft	3.2.6.4	836	
Comment Text		Page 3-15		**Response Text**
Last para: The reference to Stratus (1999) should be changed to the original source, which is Mitchell and Bennett (1983).				The text has been modified to reflect the original source of the information, which is White, 1998.
1794	Draft	3.2.6.5	837	
Comment Text		Page 3-15		**Response Text**
Last line: The last reference to Stratus (1999) should be changed to the original source, which is Hobbs and Fryklund (1968).				Text modified as per comment.
1795	Draft	3.2.6.6	838	
Comment Text		Page 3-16		**Response Text**
Strike the word "carbonate" from the last line of the first para. White (1998) is speaking of strata in general, not carbonate strata.				Text modified as per comment.

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1796	Draft	3.2.6.7	**839**	
Comment Text		Page 3-16		**Response Text**
The citation from Stratus (1999 or 2000) is incomplete which gives the sentence a different meaning. The full citation is (Stratus 2000 para 2, last sentence): "The weathering of the disseminated sulfides around the veins could produce waters that contain elevated concentrations of metals, at least in areas where there is not sufficient dilution from nonmineralized rock." [emphasis added] Additionally, the previous paragraph in Stratus (2000) discusses the potential effect of disseminated carbonates in the vicinity of veins. For completeness, this information should be added to the last paragraph in section 3.2.6.6: "The presence of abundant carbonate material surrounding the veins may limit the concentrations of naturally weathered metals in water by raising the pH and precipitating the metals as hydroxides or carbonates and/or by adsorption, which would be promoted under higher pH conditions. The alkalinity produced from weathering of carbonates surrounding veins is also important in buffering the pH of mine drainage water in the Coeur d'Alene basin."				Text modified as per comment.
1797	Draft	3.4.1.3.2	**840**	
Comment Text		Page 3-28		**Response Text**
The date given in the first sentence of the last paragraph should probably be 1988, based on the citation in the second sentence (Dames and Moore 1991).				Text modified as per comment.
1798	Draft	3.4.2.3	**841**	
Comment Text		Page 3-33		**Response Text**
Sixth line, 1st para: "gneises" should be "gneisses".				Text modified as per comment.
1799	Draft	3.4.2.4	**842**	
Comment Text		Page 3-35		**Response Text**
The first sentence is incomplete.				Text modified as per comment.
1800	Draft	3.5.1.4	**843**	
Comment Text		Page 3-41		**Response Text**
2nd para: Although most of the particulates transported by the river are deposited in the lake, a significant amount of metal associated with particulates (WWR) is discharged from the lake. For completeness, we suggest that this be pointed out in this paragraph, perhaps making reference to USGS studies discussed later in the RI (Part 7, Section 5).				Text modified as per comment.
1801	Draft	3.5.1.5	**844**	
Comment Text				**Response Text**
General: This section relies exclusively on Wyman (1993), whose studies were limited to the Spokane River above the Post Falls Dam. The section thus does not adequately describe the hydrology of CSM 5. Please make note that much of the information in this section thus refers only to conditions in the Spokane River above Post Falls Dam.				Correct. However, the descriptions still hold for many areas of the Spokane River. Text not changed.
1802	Draft	3.5.1.5	**845**	
Comment Text		Page 3-41		**Response Text**
1st para: Suggest moving reference to Post Falls Dam from the second sentence to the first sentence, e.g. "…and above Post Falls Dam the river is essentially an extension of the lake during much of the year."				Comment noted.
1803	Draft	3.5.1.5	**846**	
Comment Text		Page 3-42		**Response Text**
3rd para: The first and second sentences need to be integrated. Also, it needs to be stated that these are low flow recurrence				Text modified as per comment.

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intervals (see Wyman 1993, p. 54-55).				
1804	Draft	3.6	847	
Comment Text				**Response Text**
There are several references to "Stratus (1999a)" and "Stratus (1999)" in this section. It is clear from the text that one of the references is the Report of Injury Assessment. However, the reference section does not contain this document, but does contain a reference to a data report prepared by Stratus in 1999.				References verified and modified.
1805	Draft	3.6.1	848	
Comment Text		Page 3-49		**Response Text**
4th para: Please provide a basis for and citation for the statement regarding fish population assessments for riverine habitat in the main stem of the river.				Reference added.
1806	Draft	3.6.3	849	
Comment Text		Page 3-53		**Response Text**
2nd para: Reference to section 2.3.3.2 appears to be incorrect (no such section in Part 1).				Reference deleted.
1807	Draft	3.6.5	850	
Comment Text		Page 3-54		**Response Text**
1st sentence: Sulfur dioxide emissions also contributed significantly to the denudation of the hillsides in the vicinity of the smelter, probably having a greater initial impact (due to acidity) than the metals.				Text modified as per comment.
1808	Draft	3.6.6	851	
Comment Text		Page 3-54		**Response Text**
Line 6: "slickers" should be "slickens."				Text modified as per comment.
1809	Draft	Fig. 3.2-2	852	
Comment Text		Page 3-56		**Response Text**
Osburn Fault mislabeled as "Osborn Fault" in one location (east of mouth of Canyon Creek).				Figure modified as per comment.
1810	Draft	4.2.3.8.3	853	
Comment Text		Page 4-22		**Response Text**
Task 2 – Monitoring Wells: Multiple samples were collected from these wells. Please indicate whether these were samples from different depths (as in FSP 11A) or from different sampling events.				Text modified as per comment.
1811	Draft	4.2.3.9.3	854	
Comment Text		Page 4-24		**Response Text**
Although indicated as such in the introduction to this section, the hyperspectral imaging survey is not summarized.				Text modified as per comment.
1812	Draft	5.1, T. 5.1-1	855	
Comment Text		Page 5-1, 5-64		**Response Text**
Section 5.1, 1st para states that the COPCs not carried forward in the ERA are antimony, copper and manganese; Table 5.1-1 shows that the metals that are not COPCs are antimony, iron and manganese. Presumably iron and not copper was eliminated as a COPC for the ERA, thus Table 5 1-1 is correct and the text in section 5.1 is incorrect.				Text modified as per comment.

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1813	Draft	5.2.1	856	
Comment Text		Page 5-4		**Response Text**
3rd para, 2nd sentence: The meaning of the sentence is confused: The cells were not aggregated, the sample data were aggregated into cells (see LeJeune and Cacela 1999, p. 83).				This section has been substantially revised to include background concentrations for the Upper CDR Basin, the Lower CDR Basin and the Spokane River Basin. Calculation methods and data are included in a Technical Memorandum included as Appendix B to the EcoRA and in the Administrative Record.
1814	Draft	5.2.1	857	
Comment Text		Page 5-4		**Response Text**
3rd para: This paragraph implies (or is ambiguous) that LeJeune and Cacela (1999) added additional data to the Gott and Cathrall data set, which they did not. For clarity, description of the process by which LeJeune and Cacela calculated pooled reference values should be broadened and separated from this paragraph. Also, the additional analyses over mineralized areas were performed by grouping those samples from Gott and Cathrall (1980) that were located within mineral belts or over stocks. Thus the last sentence should read: "LeJeune and Cacela then calculated statistics for soils and rocks using the average concentration in each cell for cadmium, lead, and zinc. Additionally, subsets of the data were analyzed separately for samples located within mineral belts and samples located over monzonite stocks. This was done based on the presumption that soils and rocks collected in these areas might have higher naturally occurring concentrations of cadmium, lead, and zinc than soils and rocks collected elsewhere in the upper basin."				See response to Comment #1813.
1815	Draft	5.2.1	858	
Comment Text		Page 5-4		**Response Text**
4th para: More discussion of the reasoning why "contaminated or highly mineralized levels are better represented by the 90th percentile of the background data" should be included since screening levels for several COPCs (sediment and soil) rely on the use of this statistic.				See response to Comment #1813.
1816	Draft	5.2.1	859	
Comment Text		Page 5-5		**Response Text**
3rd para: The changes in the mean are less than two percent (as indicated in the 2nd), not 0 2 to 0.4 percent.				See response to Comment #1813.
1817	Draft	5.2.1	860	
Comment Text		Page 5-5		**Response Text**
4th para: To clarify the transition to the subsequent discussion, suggest adding to the last sentence in the paragraph: "…as summarized in the following paragraphs." or create a separate paragraph.				See response to Comment #1813.
1818	Draft	5.2.1	861	
Comment Text		Page 5-6		**Response Text**
1st para, last sentence: The discussion of the bedrock sample was not found in section 5. Please reference where the discussion may be found.				See response to Comment #1813.
1819	Draft	5.2.1	862	
Comment Text		5-8		**Response Text**
The statement in the 3rd para: "…samples falling above the anomaly points, except those possibly influenced by movement of metals in solution (below), are likely to be contaminated by mining wastes." seems to imply that the sources of metals in those samples potentially contaminated by ground water are not mining wastes.				See response to Comment #1813.

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Comments by Commenter
Ridolfi Engineers, Inc.

Comment No.	Version	Subsection / Add'l Ref	Doc ID	
	* No Watershed *			
1-Setting and Methodology				
1820	Draft	5.2.1	863	
Comment Text		Page 5-8		**Response Text**
4th para: The second sentence should begin with "For example" as Figure 5.2-8 indicates several samples are involved. Additionally, based on the discussion in this paragraph, it would seem more reasonable to exclude the potentially affected samples and use the "more likely upper values for background concentrations" of 3.8 mg/kg and 440 mg/kg for cadmium and zinc, respectively, in Table 5.2.-2.				See response to Comment #1813.
1821	Draft	5.2.1	864	
Comment Text		Page 5-10		**Response Text**
3rd para, last sentence: This sentence does not take into account that the potentially higher concentrations may be related to migration of zinc in solution from mining wastes, as discussed earlier in the section. Background concentrations (from 1st para, section 5 2) are "Those naturally occurring concentrations, which are not influenced by mining contamination…." In Canyon Creek and other highly contaminated areas of the South Fork the methodology used in this section may not be adequate to determine background concentrations of zinc outside of the influence of mining wastes.				Section revised based on the final background Tech Memo.
1822	Draft	5.3.2.2.1	865	
Comment Text		Page 5-15		**Response Text**
5th (last) para states that "The MFG high flow data were used in the evaluations of chemical mass loading in the South Fork Watersheds." It is not clear, however, how these data were used, whether they were adjusted by averaging values taken over several days or by selecting only certain values. For example, the 3rd para on this same pages states that "a total recoverable lead concentration of 1,530 µg/L was measured at CC287 (MFG Station ID CC-10) on May 18, 1991. Total recoverable lead concentrations of 38 and 30 µg/L were measured at this station on May 15 and 17. The discharge increased from 180 cfs on May 17 to 398 cfs on May 18 at this station." How was such variation treated in the evaluation of chemical mass loading?				Discrete measurement data are used in two ways to evaluate mass loading in this report. 1) Discrete data are analyzed directly by multiplying concentration and discharge to calculate a discrete mass loading value. 2) Because of the inherent variability of the system, available surface water data from 1991 through 1999 were pooled for individual locations and discharge, concentration, and mass loading estimated averages were calculated using the probabilistic modeling.
1824	Draft	5.3.2.9, 5.3.2.10	867	
Comment Text		Page 5-21		**Response Text**
"Ridolfi 1999" should be quoted as "Gearheart et al. 1999", as this document constitutes the expert witness report for five witnesses in United States v. ASARCO, et al. Civil Action No. 96-0122-N-EJL, U.S. District Court, District of Northern Idaho (three instances in these sections.)				Reference corrected.
1825	Draft	5.4	868	
Comment Text				**Response Text**
Global for 5.4.1 and 5.4.2: The link between individual calculations for specific transport mechanisms on one hand, and the probabilistic model on the other hand, is not clear. Some very generic discussion appears in section 5.4.1, p. 5-22, but the two sets of calculations are never bridged in a coherent, consistent fashion. More specifically, what information do the calculations related to specific transport mechanisms bring us, in the context of the probabilistic model? How are they used?				The individual fate and transport mechanisms can be analyzed separately to show detail at a very limited scale. When all of the different mechanisms (as identified in Section 5.4.1) are acting at once, the resulting system is so complex that a more comprehensive model is needed (Section 5.4.2).
1826	Draft	5.4.1.7	869	
Comment Text		Page 5-26		**Response Text**
1st para: The referenced section 3 5 discusses methodologies and mentions tabulation of recurrence intervals (3.5.3.7), but does not present results, as stated here in the last sentence. Are the results presented elsewhere?				Text modified as per comment.

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Comment No.	Version	Subsection / Add'l Ref	Doc ID	
*** No Watershed ***				
1-Setting and Methodology				
1827	Draft	5.4.1.8.2	870	
Comment Text		Page 5-28		**Response Text**
2nd para, last sentence: "As seen in Figure 5.4-4 for Canyon Creek, approximately 30 percent of the annual sediment discharge occurs at stream discharges greater than 300 cfs." Upon inspection of the figure, a more significant break (change in slope) seems to appear at approximately 245 cfs. About 43% of the sand fraction and 60% of the fines seem to be transported at discharges greater than 245 cfs.				Text modified as per comment.
1828	Draft	5.4.2.1.2	871	
Comment Text		Page 5-31, 5-32		**Response Text**
[Previous comment 1/6.] Although the discussion in Section 5.4 is greatly improved in terms of clarity and usefulness, it still does not discuss the seasonal cycles inherent to the loading phenomenon. The reader may be left with the impression that the variability is strictly random and unpredictable "noise." But the observations are not independent, they are linked to these seasonal cycles of high and low flows, and our impression from the brief explanation given is that the model may not take this into account. It also doesn't seem to consider the hysteresis effect, right after it was discussed in the previous section (5.3, esp. 5.3.1).				Page 5-32 to Section 5.4 2.2 (Probabilistic Model) states that the natural variability follows lognormal distributions that fit the available measurements of stream flows, metal concentrations and loadings in the basin. What gives the lognormal distributions practical value is their quantification of the accuracy of specific estimates or predictions of flow, metal concentrations and loadings within the basin. The section includes an extensive illustration that makes lognormal distributions more concrete. Following sections build on this illustration with real data and further explanations to show that the variability is not strictly random and unpredictable noise. The lognormal distributions are directly estimated from the available stream flow and concentration data using standard statistical techniques. To the extent that data reflects seasonal cycles and hysteresis effects, it is implicitly included in the lognormal distributions. The lognormal distributions are consistent with the available data and the natural variability inherent in that data.
1829	Draft	5.2	872	
Comment Text		Page 5-72		**Response Text**
Table 5.2-2. The title for this table is very confusing without a thorough reading of the text. The title attempts to explain the table, but this would be better done as a footnote where more explanation could be offered.				Background section revised. Table deleted.
1830	Draft	5.4	873	
Comment Text				**Response Text**
Figure 5.4-10, as cited in text, is incorrectly labeled Figure 5.5-10.				Figure correctly labeled in report. No modifications needed.
1831	Draft	5.4	874	
Comment Text				**Response Text**
Figure 5.4-11, as cited in text, is incorrectly labeled Figure 5.5-11.				Figure correctly labeled in report. No modifications needed.
3-CSM Unit 2, Midgradient Watersheds				
1534	Draft		3178	
Comment Text				**Response Text**
[Previous comment 3-4/163.] Surface Water Section – Global for Parts 3 and 4. Why was water year 1999 selected, was it to calibrate with the sediment transport data? Otherwise, it may make more sense to use average flowrates.				Water year 1999 was selected because it is the most comprehensive data set currently available and it correlates with the available sediment transport studies from the USGS.

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3-CSM Unit 2, Midgradient Watersheds

1535 Draft — 2.3 — **3179**

Comment Text — Global for Parts 3 and 4

[Previous comment 3-4/164.] Surface Water Section – Global for Parts 3 and 4. Please provide an estimate of bankfull flow rates. This can be obtained from plots of the other statistical flow rates as about the 1.5-year frequency event. This is important for a number of reasons – the Surface Water section includes a section with Rosgen classification. Bankfull flow data is necessary to establish these classifications. Bank-full flow rates would also help clarify sediment loading from the channel versus the overbanks, thus, this is important to understanding where the contaminants are coming from; and lastly, much of the application of channel alternatives in the FS focuses on methods that are tied to this flow rate; thus it is a necessary support for development of the response alternatives and costing.

Response Text

Estimates of the 1.5 year discharge event have been made and are now included in the text.

1536 Draft — 2.3.2.3 — **3180**

Comment Text — Global for Parts 3 and 4

[Previous comment 3-4/165.] Surface Water Section – Global for Parts 3 and 4. There is a comparison that shows how the 1999 water year deviates from normal average rates, and a statement that reads: "While these comparisons do not address monthly variations in precipitation, they do indicate that the water budget for water year 1999 was somewhat typical with above average total precipitation and below average snowfall". Please re-phase this statement. If it were "typical", there would not be a 20-inch (56%) variance from average snowfall.

Response Text

The total water budget for 1999 is very similar to the long term average. The lower than average snowfall is mentioned. As such, 1999 was "somewhat typical"

1537 Draft — 3.2.2 — **3181**

Comment Text

[Previous comment 3-4/166.] Sediment Transport Section – Global for Parts 3 and 4. Be very careful in using Rosgen Classes without more explanation as to what assumptions have been made in their development. A level I classification can be very subjective. In particular, it would be helpful to include a description of what is included in the Rosgen classification (perhaps a table with the derived values for the river with the Rosgen criteria?). In addition, we would suggest a second look at the lower portion of the river. We believe there may be two classifications: one for the straighter, somewhat steeper portion of the river between Cataldo and Rose Lake, and another below Rose Lake. The sinuosity between Rose Lake and Harrison suggests perhaps a type E channel; the slopes and entrenchment may indicate otherwise.

Response Text

Comment noted. The classifications provided are based on map and photo interpretation. This level of analysis is intended to provide general information concerning channel types. If more detailed classification is found to be useful, for specific locations in the watershed, additional effort including fieldwork should be accomplished. Text has been modified

7-Summary

1832 Draft — general — **875**

Comment Text

[Previous comment 7/1.] The document should be thoroughly reviewed by an editor unfamiliar with the details of the project. Currently, much of the information is supplied out of context and may not make sense without some additional explanation. For example, the concepts of probabilistic model and of 10th, 50th, and 90th percentile flows in section 5.3.5; the concept of sediment load threshold in section 5.3.7; and the partition between dissolved metals and whole water recoverable metals, in sections 5.3.6 and 5.3.8. Additionally, many of the technical terms in this part are not explained and are not in the Part 1 Glossary, for example, transmissivities, advective transport, epilimnetic, hypoliminion, and euphotic zone, to name a few. Clarity is particularly important because Part 7 may be the only section of the RI some people will read (many are lay persons).

Response Text

Part 7 edited to reduce discussion on the Lake and provide more balanced presentation of RI results.

Glossary in Part 1 updated to reflect RI terms.

1833 Draft — general — **876**

Comment Text

[Previous comment 7/70.] A summary conclusion section would be useful. Section 5 partly serves that purpose, but the disparity of levels of information given under the various topics, particularly in Section 5.3.8, leaves the reader confused.

Response Text

Part 7 edited to reduce discussion on the Lake and provide more balanced presentation of RI results.

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Comment No.	Version	Subsection / Add'l Ref	Doc ID	
	* No Watershed *			
7-Summary				
1834	Draft	1.0	877	
Comment Text		Page 1-1		**Response Text**
1st para: Please use more current information for this section. Substantial amounts of ore were produced after 1968. It may be useful somewhere in the introduction to summarize both pre-1968 production (before tailings containment) and total production to date.				Text updated with information from Long 1998.
1835	Draft	1.0	878	
Comment Text		Page 1-1		**Response Text**
2nd para: The phrase "substantial amount of material" is used redundantly in the 1st and 3rd sentences.				Third sentence deleted.
1836	Draft	1.0	879	
Comment Text		Page 1-1		**Response Text**
[Previous comment 7/4.] 3rd para, after 3rd sentence: Recommend adding: "The BHSS remedy explicitly excluded metals in the river, although it was expected that remedial actions conducted at the site would improve water quality in the river. The river is part of the basin-wide RI/FS, including the portion of the river that crosses the BHSS."				Text modified as per comment.
1837	Draft	1.1	880	
Comment Text		Page 1-2		**Response Text**
3rd para: The citation for U.S. v. ASARCO, Inc. should be in parentheses.				Text modified as per comment.
1838	Draft	1	881	
Comment Text		Page 1-4		**Response Text**
Figure 1-1, Woodland Park is located incorrectly on the map.				Figure corrected.
1839	Draft	1	882	
Comment Text		Page 1-5		**Response Text**
[Previous comment 7/7.] The title "Watershed Boundaries" for this figure is misleading, since only the upper part of the basin (CSM 1 and 2) is studied on the basis of watershed boundaries.				As defined in the CSM (CH2M HILL 1999 and in Part 1), CSM Units 3, 4, and 5 are watersheds.
1840	Draft	2.2	883	
Comment Text		Page 2-2		**Response Text**
2nd bullet after 1st para: The word "formation" at the end of the 1st sentence should be plural. The Columbia River basalts are subdivided into several formations.				Text modified as per comment.
1841	Draft	3.1	884	
Comment Text		Page 3-1		**Response Text**
[Previous comment 7/12.] 2nd bullet item: Remove "(other than ore)" and add "…not considered ore, but that may be mineralized."				Text modified as per comment.
1842	Draft	3.2	885	
Comment Text		Page 3-3		**Response Text**
[Previous comment 7/14.] 1st para, 2nd sentence, last line on the page: Change to: "Methods include (1) determination of pre-mining metal background concentration…" Gott and Cathrall's study in 1980 came after a century of mining.				The background section was revised to include estimates of background concentration ranges in the Upper CDR Basin, Lower CDR Basin, and the Spokane River Basin. Text revised to reflect new background text.

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* No Watershed *				
7-Summary				
1843	Draft	3.2.2	886	
Comment Text		Page 3-3		**Response Text**
1st para: Suggest including that the COPCs are listed in Table 3.2-1.				Text modified as per comment.
1844	Draft	4.0	887	
Comment Text		Page 4-1		**Response Text**
1st para: The early gravity concentrators produced both coarse (jig) tailings and fine (slimes) tailings. The latter were mostly carried downstream, leaving the former behind. Please consult expert reports by Quivik (1999) and Bull (1999) to provide a more accurate depiction of character of gravity and flotation tailings. Table 4 3-2 also requires revision in this sense.				Text modified to include reference to fine-grained jig tailings.
1845	Draft	4.3	888	
Comment Text		Page 4-5		**Response Text**
2nd para: The citation for Ridolfi (1999) is not in the reference list; however, as noted in previous comments, the citation for this document should be Gearheart et al. (1999).				Text modified as per comment.
1846	Draft	4.4.1	889	
Comment Text		Page 4-6		**Response Text**
1st para: The next to last sentence needs revision, or explanation as to how two unconfined aquifers can exist in lower Canyon Creek.				Text modified as per comment.
1847	Draft	4.4.2	890	
Comment Text		Page 4-6		**Response Text**
1st para: The first sentence is misleading. Only part of the South Fork is known to have a two-aquifer system; no similar information is available for the North Fork, as indicated in subsequent text.				As stated in the first sentence, it "appears" that there is a also a two-aquifer system in the North Fork. The presence of alluvium over bedrock is observed in areas, similar to that observed and confirmed by soil borings, in areas of the South Fork and its tributaries.
1848	Draft	4.4.3	891	
Comment Text		Page 4-7		**Response Text**
1st para: In the last sentence, suggest replacing "will be an issue" with "will require consideration."				Text modified as per comment.
1849	Draft	4.5	892	
Comment Text		Page 4-9		**Response Text**
3rd para: The wording of the last sentence should be modified to indicate that human activities have limited channel migration, and prior to these activities, the channel did migrate.				Text modified as per comment.
1850	Draft	4.5	893	
Comment Text		Page 4-9		**Response Text**
[Previous comment 7/34.] 4th and 5th paras: Some statements contained in these two paragraphs are not consistent with the most recent RI information. In particular, last sentence of 4th para: "Most of the fine particles carried by the Coeur d'Alene River are most likely deposited in the lake before the water exits via the Spokane River" (partially correct but misleading, since transport through the Spokane does take place, esp. during certain high flow events, and during the winter); suggest rewriting as "Some of the fine particles…"; and 3rd sentence of 5th para: "very few sediments accumulate in the Spokane River channel, however, because the river carries very little suspended sediment at low flow" (substantially true but misleading because contamination of sediments in the Spokane River from upstream (CdA) sources has nevertheless taken place). Suggest reviewing information presented in				The text in paragraph 4 "Most" of the fine material " as written is correct. Paragraph 5 rewritten in response to comments from John Roland from Ecology.

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7-Summary				
Grosbois et al. (2000) and Woods (2000).				
1851	Draft	4.5	894	
Comment Text		Page 4-9		**Response Text**
5th para: The information in this discussion of the character of the Spokane River is limited to the reach above Post Falls Dam (see similar comments in Part 1 review comments).				Text modified in response to Comment from John Roland from Ecology.
1852	Draft	4.1	895	
Comment Text		Table 4-1		**Response Text**
Table 4-1, [Previous comment 7/46.] The addition of the coefficients of variation (CV) is an improvement, but the concept is not explained in the text. Since this summary (Part 7) may very well be the only RI section that many readers will consult, it is important that they receive sufficient information to interpret the report and that they not be given an exaggerated impression of precision and absolute knowledge.				Coefficients of variations have been added to the summary tables of the probabilistic modeling results to give reviewers an idea of the associated uncertainty in results. The definition of the coefficient of variation added to the footnotes of Table 4-1. Text in Section 5 3.1 has been added to introduce the model and point readers to where details may be reviewed.
1853	Draft	Table 4-1	896	
Comment Text		Page 4-12 through 4-16		**Response Text**
Loading summaries in the table mix instantaneous measurements for Beaver Creek and Big Creek with results that are derived from the probabilistic model for other watersheds. This should be acknowledged in the footnotes for the table, with some explanation as to the comparability the two types of results. It is clear, for example, that the total lead load for Big Creek is significantly different from what would have been derived from the probabilistic model, if there were sufficient data from the watershed.				Table modified for clarity; however, uncertainty associated with small data sets is discussed in the individual watershed report sections on mass loading (4.2 and 5) and is not repeated here.
1854	Draft	5.2	897	
Comment Text		Page 5-3		**Response Text**
[Previous comment 7/47.] The recent USGS work performed for the RI is briefly mentioned, but Barton (2000) is not cited and no specifics are presented.				Barton reference added.
1855	Draft	5.2	898	
Comment Text		Page 5-4		**Response Text**
1st para: Even though the BLM source area list uses the name "Hecla-Star Tailings Ponds" these ponds are more correctly referred as the Star-Morning ponds, since the Hecla Mine did not contribute to the ponds. The BLM source area list shows the size of these ponds as 62 acres.				For consistency with all the tables, text, and figures, the name has not been changed.
1856	Draft	5.2.1	899	
Comment Text		Page 5-5		**Response Text**
[Previous comment 7/48.] 3rd para and Table 5.2.1-1: The main observation that comes to mind when looking at these results is not so much the high variability at given sampling interval depths, but rather the low variability from one sampling depth to another for a given well.				Text modified as per comment.
1857	Draft	5.3.1	8100	
Comment Text		Page 5-6		**Response Text**
[Previous comment 7/49.] This technical memorandum is not yet available, but its importance is clear. Until it is available, we cannot comment extensively on the description of the methodology employed.				Text revised to include a more detailed introduction to the model and where readers can look for more details.

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7-Summary

1858 Draft — 5.3.1 — **8101**

Comment Text — Page 5-6

Please include a summary explanation in this section of the probabilistic model to help the reader understand, at least in a rudimentary sense, what is meant by "estimated expected values."

Response Text

Text added to clarify that this section presents results from the probabilistic model and a brief description of what the model is.

1859 Draft — 5.3.2, T. 4-1 — **8102**

Comment Text — Page 5-6, 4-12

2nd and 4th paras: Some of the discharge values presented in these paragraphs do not match the discharge values referred to in Table 4-1. Some are not presented in the table (Silverton, Elizabeth Park); others are different than presented in the table (Canyon, Ninemile and Big Creeks).

Response Text

This table (Table 4-1) was not meant to provide an exhaustive listing of all locations for which discharges were calculated. Rather, it summarizes information for the main tributaries and rivers. Therefore, for example, Silverton and Elizabeth Park are not included in Table 4-1 because they are locations on the South Fork CdA River and do not represent the total discharge from the river.

Text values updated to match supporting tables and Appendix C.

1860 Draft — 5.3.2 — **8103**

Comment Text — Page 5-6

[Previous comment 7/50.] 3rd and 4th paras: The discussion of loosing and gaining reaches in Canyon Creek, Ninemile Creek, and the South Fork would be greatly helped by figures.

Response Text

This information is available in the figures at the end of this section, for example, Figure 5.3 5-5. These figures list the expected loads for a given metal and discharge at various locations.

1861 Draft — 5.3.2 — **8104**

Comment Text — Page 5-6, 5-7

[Previous comment 7/51.] The use of precise "expected" values for estimates that vary over a significant range is misleading. The preferred way would be to present ranges, brackets, confidence intervals, or similar device.

Response Text

Coefficients of variation added to summary tables to give reviewers a measure of the associated uncertainty.

1862 Draft — 5.3.3, T. 4-1 — **8105**

Comment Text — Page 5-7, 5-8

Again, stations used in and central to the discussion are not presented in Table 4-1. Including these stations in the table would aid the reader in following the discussion.

Response Text

Sampling locations added to Table 4-1.

1863 Draft — 5.3.5 — **8107**

Comment Text — Page 5-9

1st para: Sentence 6: Are the greater than order of magnitude exceedances for total lead based on the 90th percentile TMDL values? How is this comparison valid, since the TMDLs are based on dissolved lead?

Response Text

This issue was debated early in the decision process as to how to present data. Because most of the cadmium and zinc are in the dissolved phase, estimated dissolved loads of cadmium and zinc were compared to TMDLs. Because most of the lead (typically > 80%) is in the particulate phase, total lead loads were compared to TMDLs. Otherwise, in the comparisons with TMDLs we would sometimes be addressing less than 10% of the lead. We have stated in the text what we are doing with the lead for discussion purposes. A total lead TMDL was calculated using the methods described in EPA's TMDL document for the CDAR. Estimated dissolved lead loads have also been computed (presented in tables) and would be compared to TMDLs before any decisions are made based on the lead loads. Regardless, which way the data are discussed, zinc is the driver in the basin.

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7-Summary

1864 Draft — 5.3.5 — **8108**

Comment Text — Page 5-9

[Previous comment 7/52.] 3rd para: We have made several comments on the probabilistic model as described in RI Parts 1 through 5. To sum up, we have concerns about the usefulness of the model as it is presented here, because it does not take into account the cyclic, seasonal nature of the system. The intent is to allow the estimation of "the probability that the observed mass loading at any given time will not be exceeded by the estimated mass loading at that cumulative probability." But this estimate is only valid over a long period of time, not with regard to a specific day. In other words, the probability of exceeding a particular flow rate on any day over a year or more is different from the probability of exceeding the same particular flow rate on a day in October or on a day in May. In October (i.e., during low flow season), the probability of exceeding will be much smaller, while in May (i.e., during high flow) it will greater. Put more generally, the model allows only long-term predictions (over years). The mathematical term "expected value" can, in that sense, be misleading since it has a different sense from the common use. Care must also be taken to report expected results as ranges, rather than point values, which in the context are not meaningful.

Response Text

No model will be able to predict what the mass loading will be on a specific date.

The intent of the model is not correctly stated in the comment. Without looking at data over a long time period, individual measurements have limited value. We have no idea if the measurement is expected to occur once every year or once every thousand years. The seasonal variations in loading help quantify the significance of an individual measurement.

1865 Draft — 5.3.7 — **8109**

Comment Text — Page 5-10, 5-11

[Previous comment 7/55.] Although the revised text supplies a useful example case, the concept of thresholds for sediment transport needs to be supported by figures. Perhaps repeat one from RI Part 1 to illustrate the concept. Also give an illustrative example in the text to show the use of this information (e.g , rapid and massive mobilization of particulate lead at high flows/flood conditions).

Response Text

To limit the size of the RI, redundancy has been minimized. Please refer to Part 1 and supporting watershed sediment transport sections for detailed discussions. Part 7 is meant as a concise summary of the RI. For locations with measured sediment transport data, details are included in Parts 2 through 6, Section 3.0.

1866 Draft — 5.3.8 — **8110**

Comment Text — Page 5-12 to 5-25

[Previous comment 7/56.] The entire section should be condensed and simplified for the lay reader. While it is clear that an effort has been made to summarize the material presented in RI Part 5: CSM 4, the findings need to be distilled further.

Response Text

Section 5.3.8 edited to provide a more balanced presentation of the RI results; therefore, the discussions on the Lake have been greatly reduced.

1867 Draft — 5.3.8.1 — **8111**

Comment Text — Page 5-13

1st para: Please indicate the station locations for the inflow loads. Also, this section should explain what is meant by whole water recoverable vs. dissolved or filtered (this is not covered in either Part 1 or Part 7). Additionally, some explanation should be given as to the meaning of negative residual cadmium loads, i.e., more cadmium leaves the lake during certain years than enters the lake. For example, what are the potential sources of additional masses of cadmium?

Response Text

See response to Comment #1866.

1868 Draft — 5.3.8.2.2 — **8112**

Comment Text — Page 5-15

First line: "…for the years…" should be "…for the water years…" based on the footnote in Table 5.3.8-3.

Response Text

See response to Comment #1866.

1869 Draft — 5.3.8.2.3 — **8113**

Comment Text — Page 5-15

2nd para: The 3rd para indicates that overflow occurs all months except October, November and December, which is what Paul Woods indicated at the Lake Meeting on 1/9/01. However, the 2nd para indicates that overflow occurs from March through September.

Response Text

Overflow occurs in all months except October, November, and December - 3rd paragraph. Overflow typically occurs from March to September. In other words, there were some overflow events in January and February but they were not typical.

See response to Comment #1866.

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	* No Watershed *		

7-Summary

1870 Draft — 5.3.8.5.2 — Page 5-19 — **8114**

Comment Text

[Previous comment 7/58.] 3rd para: The discussion of benthic fluxes should perhaps not quote specific values since there was so much variation between the results obtained through various methods (as discussed in RI Part 5: CSM 4).

Response Text

Only the in situ flux measurements were cited and these are the only measurements that are being considered reliable because of experimental difficulties with the other types of benthic flux measurements.

See response to Comment #1866.

1871 Draft — Figures 5 3.5-5, 5.3.5-8 — **8115**

Comment Text

Some of the information in these figures does not match Table 4 1, specifically, the discharge and the estimated expected loads for the North Fork at Enaville (these values do not match those in Part 3 either). Additionally, using an average of instantaneous measurements of total lead load for Big Creek (Fig. 5 3.5-5) erroneously gives the impression that Big Creek is a major lead source relative to other watersheds. The load given (47 lbs/day) should be qualified with a footnote.

Response Text

Fate and transport modeling result summaries in the RI revised to match results in supporting tables and Appendix C. Note some of the values presented have been revised since the publication of the Draft RI.

1872 Draft — Table 5.1.1-2 — Page 5-56 — **8116**

Comment Text

The title of this table indicates it is from the Feasibility Study, whereas the information/analysis presented is assumed to be a Remedial Investigation function. Is this title in error? Also, the Interstate-Callahan mine and mill complex in Ninemile Creek is omitted.

Response Text

Title revised. The RI report is meant as a data report. Major source areas were identified during the FS.

The Interstate-Callahan mine and mill complex was not identified during the RI/FS process as one of the major source areas.

1873 Draft — Table 5.1.1-3 — Page 5-57 — **8117**

Comment Text

[Previous comment 7/62.] In the TDMS export dated April 6, 2000, from URS as updated per subsequent URS modifications (URS 2000), as well as in the RI screening results maps (URS and CH2M Hill 2000), we find locations attributed to the Tamarack No. 7 site but not listed here (e.g , subsurface sample CC433), and having concentrations falling outside the range presented here (e.g., zinc concentration of 558 mg/kg for CC433). It is possible that these samples were rejected because they were neither waste rock nor alluvium, but it is not possible to ascertain this because the type of material is not identified in the sample information in either source.

Response Text

Location CC433 was collected down gradient of the Tamarack No. 7 near the Flynn mine. Location cross reference information in the TDMS was added as reported on field sampling forms. Inconsistencies may be present due to the lack of recognizable boundaries in the field between source areas.

1874 Draft — Table 5.1.1-4 — Page 5-57 — **8118**

Comment Text

[Previous comment 7/63.] In the TDMS export dated April 6, 2000 (URS 2000), we find the matrix for locations presented this table identified as "rock/cobbles/gravel" rather than "surface sediment/alluvium". In addition, these sampling points were not found on the RI screening results maps (URS and CH2M Hill 2000).

Response Text

These samples were collected from within the floodplain, and metals were measured using field portable XRF. Their location/matrix type are correctly identified in the table.

1875 Draft — Table 5.1.1-5 — Page 5-58 — **8119**

Comment Text

[Previous comment 7/64.] In the TDMS export dated April 6, 2000 (URS 2000), we find locations attributed to the Tamarack No. 7 site but not listed here (e.g., CC423, ground water well in mine waste rock pile), and having concentrations falling outside the range presented here (e.g., dissolved zinc concentration of 1090 ug/L for CC423).

Response Text

Locations CC423 is located further down gradient and is not associated with the Tamarack No. 7 site. Location cross reference information in the TDMS was added as reported on field sampling forms. Inconsistencies may be present due to the lack of recognizable boundaries in the field between source areas.

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*** No Watershed ***

7-Summary

1876 Draft — Tables 5.3.8-1 to 5.3.8-5 — **8120**

Comment Text

[Previous comment 7/67.] Again, ranges should be reported for the estimated values.

Response Text

Coefficients of variations added to modeling results summary tables to give reviewers an indication of the associated uncertainty.

1877 Draft — 6 — **8121**

Comment Text

General: The reference section is incomplete. For example, several of the references cited Section 5 are not listed with the Section 5 references.

Response Text

References revised.

1878 Draft — Attachment 1 — **8122**

Comment Text

[Previous comment 7/68.] The numbers don't match what we retrieve in the TDMS export dated April 6, 2000 (URS 2000). For example, several adit drainage samples exhibited dissolved and total metal values higher than those listed; e.g., in Canyon Creek, the maximum dissolved zinc reading for an adit is for CC355 (Gem No. 3), 17300 ug/L, May 17, 1991. If we restrict it to the RI sampling, we still find a value of 13200 ug/L at the same location for May 12, 1998. This is significantly higher than the maximum value listed in Attachment 1. There are multiple examples in the table of similar differences.

Response Text

Tables regenerated using the revised screening levels/background values.

1879 Draft — Attachment 1 — **8123**

Comment Text

(This comment overlaps with previous comment 7/68). Adit and Seep Drainage: There appear to be problems with these summaries. For example, higher dissolved zinc concentrations are known from adit drainage in Canyon Creek and Ninemile Creek than are reflected in the table (e.g., Success No. 3, Gem No. 3). Also, the total number of adit and seep samples analyzed for dissolved zinc in Canyon Creek (158) seems excessively high. We suggest that all of these tables be carefully compared to the source data.

Response Text

Tables regenerated using the revised screening levels/background values.

Pine Creek

2-CSM Unit 1, Upper Watersheds

1529 Draft — 4.1, 5.4 — **3173**

Comment Text — Tables 4.1-1 thru 4.1-3, 5.4-1

These tables do not offer the information that would be needed in the FS, in particular quantity estimates, volumes, depths, and other information on the extent of the primary identified sources.

Response Text

To reduce the overall size of the RI/FS, volume estimates, depths and other source area specific information is included in the FS.

1530 Draft — 4.1 — **3174**

Comment Text — Tables 4.1-1 thru 4.1-3

These tables are based solely on the inventory prepared by BLM. While it is an excellent source of information and a good choice for the core inventory, other sources need to be added. In particular, the surficial geology analysis prepared by Box et al. (1999) does not entire coincide with the BLM inventory, but is a very important source of information. New polygons should be created and added to those of the BLM source inventory.

Response Text

The BLM GIS coverage was selected as the base for identifying source areas in the RI. Further refinement of the floodplain source area boundaries are included in the FS and will be an ongoing task as areas are identified for action and more data are gathered. No modifications necessary.

1531 Draft — 5.4 — **3175**

Comment Text — p. 5-44

Table 5.4-1 No justifications are offered to support the choice of these sites. As it is, we assume that these sites are selected solely

Response Text

Table 5.4-1 edited to match section 4.1 lists of major source areas and the source areas

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Pine Creek				
2-CSM Unit 1, Upper Watersheds				
on the basis of being situated in a load increase reach. This should be stated, and an overall explanation of the selection process should be added to the main text. The following comments address individual entries.				identified in the FS.Text added to present selection criteria.
1532	Draft	5.4	3176	
Comment Text		p. 5-44		**Response Text**
Table 5.4-1 Coeur d'Alene Antimony Mine: No samples reported; the description in Table 4.1-3 says "Upland waste rock." We have found no information suggesting that it deserves to be considered a major source.				Table 5.4-1 edited to match section 4.1 lists of major source areas and the source areas identified in the FS.Text added to present selection criteria.
1533	Draft	5.4	3177	
Comment Text		p. 5-44		**Response Text**
Table 5.4-1 We recommend adding the following sites to the list of probable major source areas: Highland-Surprise mine and mill and Sydney mine and mill on Red Cloud Creek (mill site soils samples with high metal contents, and adit drainage with low flow but high metal contents) (McNary et al. 1995); and Nevada-Stewart mine (adit drainage with low flow but high metal contents) (Mc Nary et al. 1995).				Table 5.4-1 edited to match section 4.1 lists of major source areas and the source areas identified in the FS.Text added to present selection criteria.
Upper South Fork				
2-CSM Unit 1, Upper Watersheds				
1496	Draft	1.0	3140	
Comment Text		p. 1-1		**Response Text**
1st para, 2nd sentence: this indicates "jig tailing piles", however the text in section 2 2 discusses mills with flotation circuits; this should be revised to read "jig and flotation tailings".				Text modified.
1497	Draft	1.1	3141	
Comment Text		p. 1-2		**Response Text**
1st para: Please add appropriate references for the statements concerning fish population data.				Reference to fish assemblages study by T Maret (USGS) 2001 added.
1498	Draft	2.1	3142	
Comment Text		p. 2-1		**Response Text**
1st para: Please add information regarding the size of the drainage area to this section.				Drainage area is addressed in Section 2 3
1499	Draft	2.1.2	3143	
Comment Text		p. 2-1		**Response Text**
3rd para: This information doesn't relate to bedrock geology; other bedrock geology sections have not included similar information. Suggest deleting paragraph.				The paragraph has been deleted.
1500	Draft	2.1.6	3144	
Comment Text		p. 2-4		**Response Text**
2nd para: Please add the location for the Northern Idaho Metals Company settling pond and flotation mill ("midway between Mullan & Wallace", according to Quivik (1999) (the facility is not listed in Table 2.1-2 and should be added).				The locations have been added.
1501	Draft	2.2.1	3145	
Comment Text		p. 2-5		**Response Text**
1st para: The watershed isn't a montane alluvial valley; please re-word to clarify.				Text modified to remove classification of montane.

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Upper South Fork				
2-CSM Unit 1, Upper Watersheds				
1502	Draft	2.2.2	3146	
Comment Text		p. 2-6		**Response Text**
The aquifer parameters provided in Table 2.2-1 reflect a wide range in hydraulic conductivity obtained from the upper watershed of the Smelterville Flats/Bunker Hill formation. As the upper South Fork is some distance away, it may not be appropriate to use these values for this area. In addition, the range provided encompasses several orders of magnitude of flowrates (500 – 10,790 ft/day); it may be prudent to add a note indicating a high degree of variability with specific on-site data to be required during design.				Text modified to include need for site-specific data during design.
1503	Draft	2.2.6	3147	
Comment Text		p. 2-7		**Response Text**
Please summarize the ground water use data from the Human Health Risk Assessment, so that this section is consistent with the other watersheds.				Text added.
1504	Draft	2.3.1	3148	
Comment Text		p. 2-8, 2-29		**Response Text**
T.2.3.2-2 The WRCC precipitation station at Wallace has a near 100-year record; it would be pertinent to include these data as a comparison to the 1999 water year data that was used. (Note this type of information – with a longer period of record, is used for modeling design for containments and other portions of the alternatives for the FS).				The WRCC station at Wallace (109493) has period of record from 12/1/1907 to 5/31/62. The WRCC station at Wallace Woodland Park has period of record 8/1/1948 to present. Because the Woodland Park station is currently collecting data, this station was used. Period of record averages were added to the table.
1505	Draft	2.3	3149	
Comment Text		p. 2-11		**Response Text**
Please provide a summary table of flow rates to use in developing the FS. Include mean low and high base flow rates, bank-full flow and the estimated 100-year flood discharge.				Discharges at specified recurrence intervals is shown in Table 2.3 2-1. Baseflow estimates are indicated in section 2 3.2 1.
1506	Draft	2.3	3150	
Comment Text		p. 2-29		**Response Text**
Table 2 3.2-2: The WRCC Gage at Wallace has a near 100-year record; it may be pertinent to include this data as a comparison to the 1999 water year data that was used				The WRCC station at Wallace (109493) has period of record from 12/1/1907 to 5/31/62. The WRCC station at Wallace Woodland Park has period of record 8/1/1948 to present. Because the Woodland Park station is currently collecting data, this station was used. Period of record averages were added to the table.
1507	Draft	2.3.2	3151	
Comment Text		Fig. 2.3.2-1		**Response Text**
Is the break in the record between 11/9/87 and 11/9/98 represent an error, or is there no data for this period; if the former please fix, if the latter please explain.				Estimates of mean daily discharge for the Upper South at Wallace were made using discharge measurements from USGS gage 12413150 SF Coeur d'Alene River at Silverton. The USGS didn't report data from this gage over this period.
1508	Draft	3.1	3152	
Comment Text		p. 3-2		**Response Text**
It is unfortunate that sediment transport data sufficient to allow sediment transport analyses of the Upper South Fork River is not available. It is also unfortunate that the estimate that was performed for the Upper South Fork was done as a simplistic multiplication of the average sediment rates from Canyon Creek and Ninemile Creek times the watershed area. The data from these watersheds may not reflect that they have recently (1994-96) had their sediment regimes disrupted (400,000+ CY removed from Ninemile Creek); it may not be appropriate to use these values to develop the sediment transport rates for this watershed, as there				The simplistic approach taken was selected to use the available information and to be consistent with methods used in other watershed reports. Developing a theoretical transport value based on existing information likely would have similar uncertainties as the model used.

Comment No.	Version	Subsection / Add'l Ref	Doc ID

Upper South Fork

2-CSM Unit 1, Upper Watersheds

have been no such removals. It may be more appropriate to use grain size data from the sediment sampling performed, and to develop a theoretical transport value based on the range of flowrates from the channel and one or several of the available sediment transport formulae.

1509 Draft | 3.2.2 | p. 3-4 | **3153**

Comment Text

To make the discussions of channel type comparable, please add that channel slopes for "C"–type channels are generally less than 2 percent.

Response Text

Text added.

1510 Draft | 3.2.3 | p. 3-5 | **3154**

Comment Text

Several of the reaches of the Upper South Fork have riprap along the banks; this may not be reflected in aerial photography, but affects sediment transport and the definition of reaches requiring action under the FS. This pertinent data should be reflected in the discussions.

Response Text

Riprap along river banks can influence the characteristics of stream and sediment discharge. The scale of the reviewed aerial photographs was such that these features were not visible. Selected remedies for this area will take this into account during design.

1511 Draft | 3.2.3 | p. 3-5 | **3155**

Comment Text

Coordinate text with Figures 3.2-1 and 3.2-2: Mine sources discussed in the text as being adjacent to the stream channel should be reflected in the figures.

Response Text

Labels added to figures.

1512 Draft | 3.3 | p. 3-7 | **3156**

Comment Text

1st para: The statement "This estimate may be high or may be low, as no sediment transport data is available" may be true, but renders Section 3.1 useless. Suggest revising or removal.

Response Text

Due to the large geographic area covered in this RI/FS, it was not practical to collect data for all areas of the basin. However, do to similarities in geography, topography, mining practices, and fate and transport mechanisms, it is reasonable to draw general conclusions about watersheds without site-specific data from available data sets on similar watersheds. The inherent uncertainty in this approach is acknowledged in the text.

1513 Draft | 3.3 | p. 3-7 | **3157**

Comment Text

1st and 2nd para: It may not be appropriate to recommend channel restoration measures in this section, or in the RI; we suggest coordination with the FS counterpart to make sure appropriate measures are included into the alternatives for this watershed.

Response Text

Reference to proposed restoration methods removed.

1514 Draft | 4.1.1.3 | p. 4-3 | **3158**

Comment Text

Please clarify the statement that: "Cadmium, lead, mercury, and zinc were detected at one to many sampling locations". As mentioned in earlier comments, one fix would be to say, "…were detected at more than one sampling location." However, perhaps more consideration should be given as to how this data can be presented so that it will help guide the reader in understanding the nature and extent of the problem. More importantly, how can the information in the current format be used in the FS to help with alternative development and evaluation?

Response Text

Text in this section completely revised to reflect new screening levels.

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	Upper South Fork			
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1515	Draft	4.1.1.5, 4.1.1.6	3159	
Comment Text		p. 4-3, 4-4		**Response Text**
Please clarify why, if there are metals detected at higher than 10X screening levels at the Copper King Mine and at the Reindeer Queen Mine and these sites merit discussion in Section 4.1 1.5 (bottom page 4-3), these mines have not been included in the listing of Major Source Areas on Page 4-4. Please coordinate these discussions. Also, is it discussed somewhere that only approximately 10 percent of the identified sources areas were sampled? What of the remainder?				The list of major sources revised for consistency with the FS. Do to the limited resources available to EPA for this project, it was not possible to sample all 1080 source areas.
1516	Draft	4.1.1	3160	
Comment Text		p. 4-2, 4-3		**Response Text**
As a whole these discussions reflect a data dump – is there anywhere where it is possible to provide some meaning to the "nineteen sediment samples"? How do these data lead you to the identification of the major sources areas in 4.1.1.6? How does this define the extent of the contamination? How can this be used to understand the locations of the sources areas (per guidance); and how does this information help support the development of FS Alternatives?				The RI is meant as a data report. Detailed analysis of all 18,000 sample results was not within the scope of this evaluation. Because of the amount of data available and the geographic size of the Basin, a probabilistic model was developed to integrate available information and be able to draw scientifically justifiable conclusions. Major source areas were identified in the RI/FS process from estimates of dissolved zinc mass loading. Observed increases in stream segment reaches were initially used to identify potential loaders. More detailed review of available adit, seep, upland soil, and instream sediment data were then used to confirm the initial findings. The list of major source areas identified in this manner is included in the RI and FS.
1517	Draft	4.1	3161	
Comment Text		Figs. 4.1-1, -2, -3		**Response Text**
Please work with Graphics so that surface water sample locations line up with river. In addition, it may be helpful to somehow highlight the primary sources to make them standout from the other 200+. Perhaps bold font, underlining, or a box could be used.				Survey information for all sampling locations was used as reported (historical data sets or from GPS measurements reported for the RI work) and cannot be adjusted arbitrarily. Though highlighting the major source areas on several hundred figures may be beneficial, it is considered an unnecessary style refinement.
1518	Draft	4.1	3162	
Comment Text		Fig. 4.1-10		**Response Text**
Please clarify and label which geologic units are being depicted. Are these tailings, alluvium, bedrock? Also, please clarify source of floodplain mapping shown – presume it is coverage of 1979 FEMA maps?				The reference for the geologic units is stated on the figures and is included in Section 6.0 References. The geologic units are discussed in Section 4.1 1.6. Reference to floodplain boundary coverage added to the text and Section 6.0.
1519	Draft	5.2.1	3163	
Comment Text		p. 5-2		**Response Text**
Please re-write this section and summarize the salient points that help the common person understand what is important from what you have done.				Results are summarized and conclusions presented in the summary in Section 5.4.
1520	Draft	5.3.1, 5.3.3	3164	
Comment Text		p. 5-7, 5-8		**Response Text**
Please resolve the discrepancy between the last para of 5.3 1 that indicates that "suspended sediment and bedload samples were not analyzed for total metals, therefore mass loading was estimated from total and dissolved surface water data" and the last sentence of Section 5.3.3 that indicates that "suspended and bedload samples may be represented by metals concentrations reported for soil and				Sentence deleted.

Upper South Fork

2-CSM Unit 1, Upper Watersheds

sediment samples collected in the Upper South Fork. As presented in Section 4 1, metals concentrations in soil and sediment samples exceeded screening levels, especially for antimony, arsenic, cadmium, lead and zinc." (copper from Reindeer Queen?) Under either scenario, the metals present in sediment in excess of screening do not appear to have been included in the contaminant mass balance for the watershed.

Comment No.	Version	Subsection / Add'l Ref	Doc ID
1521	Draft	4.1.1.6, 5.4	3165

Comment Text (p. 4-4, 5-36)

T.5.4-1 Please resolve the identification of major source areas for the Upper South Fork watershed; the bulleted text in Section 4.1.1.6 does not agree with the sources listed in Table 5.4-1. Neither addresses the Reindeer Queen or the Copper King.

Response Text

Table 5.4-1 edited to match section 4.1 lists of major source areas and the source areas identified in the FS.Text added to present selection criteria.

Comment No.	Version	Subsection / Add'l Ref	Doc ID
1522	Draft	4.1.1.6, 5.4	3166

Comment Text (p. 4-4, 5-47)

Table 5.4-1 The list of "major source areas" in Section 4 and the list of "potential major source areas" in Table 5.4-1 need to be coordinated. We recommend moving Table 5.4-1 to Section 4 and editing it to reflect the information presented in this chapter.

Response Text

Table 5.4-1 edited to match section 4.1 lists of major source areas and the source areas identified in the FS.Text added to present selection criteria.

Comment No.	Version	Subsection / Add'l Ref	Doc ID
1523	Draft	4.1, 5.4	3167

Comment Text (Tables 4.1-1 and 5.4-1)

These tables do not offer the information that would be needed in the FS, in particular quantity estimates, volumes, depths, and other information on the extent of the primary identified sources.

Response Text

To reduce the overall size of the RI/FS, volume estimates, depths and other source area specific information is included in the FS.

Comment No.	Version	Subsection / Add'l Ref	Doc ID
1524	Draft	4.1	3168

Comment Text (Table 4.1-1)

This table is based solely on the inventory prepared by BLM. While it is an excellent source of information and a good choice for the core inventory, other sources need to be added. In particular, the surficial geology analysis prepared by Box et al. (1999) does not entire coincide with the BLM inventory, but is a very important source of information. New polygons should be created and added to those of the BLM source inventory.

Response Text

The BLM GIS coverage was selected as the base for identifying source areas in the RI. Further refinement of the floodplain source area boundaries are included in the FS and will be an ongoing task as areas are identified for action and more data are gathered. No modifications necessary.

Comment No.	Version	Subsection / Add'l Ref	Doc ID
1525	Draft	5.4	3169

Comment Text (p. 5-36)

Table 5.4-1 No justifications are offered to support the choice of these sites. As it is, we assume that these sites are selected solely on the basis of being situated in a load increase reach. This should be stated, and an overall explanation of the selection process should be added to the main text. The following comments address individual entries.

Response Text

Table 5.4-1 edited to match section 4.1 lists of major source areas and the source areas identified in the FS.Text added to present selection criteria.

Comment No.	Version	Subsection / Add'l Ref	Doc ID
1526	Draft	5.4	3170

Comment Text (p. 5-36)

Table 5.4-1 Mary D Claim Workings: No samples reported; the description in Table 4.1-1 says "Floodplain waste rock." We have found no information suggesting that this site deserves to be considered a major source.

Response Text

Table 5.4-1 edited to match section 4.1 lists of major source areas and the source areas identified in the FS.Text added to present selection criteria.

Comment No.	Version	Subsection / Add'l Ref	Doc ID
1527	Draft	5.4	3171

Comment Text (p. 5-36)

Table 5.4-1 The Morning No. 6 site should be added to this list; it includes adit drainage, a seep at the rock dump, an NPDES permitted outfall (subject to the TMDL limits), all of which have elevated metal concentrations; buildings and structures, floodplain tailings, and a floodplain waste rock pile. This site is listed as a major source area in the text, in Section 4.1 1.6. This section also lists the Gold Hunter No. 6 site (adjacent to the Lucky Friday mine complex), the Grouse Creek Star (1200 Level) site, and the Upper South Fork impacted floodplain areas.

Response Text

Table 5.4-1 edited to match section 4.1 lists of major source areas and the source areas identified in the FS.Text added to present selection criteria.

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Comment No.	Version	Subsection / Add'l Ref	Doc ID
	Upper South Fork		
2-CSM Unit 1, Upper Watersheds			
1528	Draft	5.4	**3172**

Comment Text (p. 5-36)

Table 5.4-1 Since some upland sites are listed, other upland sites such as the Silver Cable, You-Like, Star 1200 Level (also mentioned as major source area in Section 4.1 1.6), and Morning No. 4 and 5 should be included. Adit drainage samples from these sites show high metal contents (Hecla 1991; Balistrieri et al. 1998; Kauffman et al. 1999; URS 1999, 2000). These sites also include upland waste rock.

Response Text

Table 5.4-1 edited to match section 4.1 lists of major source areas and the source areas identified in the FS.Text added to present selection criteria.

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Draft
Comments by Commenter
(b) (6)

Comment No.	Version	Subsection / Add'l Ref	Doc ID

Coeur d'Alene Lake

5-CSM Unit 4, Coeur d'Alene Lake

2324 Draft — 1.0 — **1836**

Comment Text

"Except for fill for the Union Pacific Railroad, local spills of ore and concentrates being transported to and from the Coeur d'Alene River basin,. . .there are no primary source areas in the Coeur d'Alene Lake area." Modify this to include the recent (2000-2001) UPRR samples from Harrison to Heyburn.

Response Text

See response to Comment #2299.

2325 Draft — 1.0 — **1837**

Comment Text

"As part of the Consent Decree for the UPRR Wallace-Mullan Branch, contaminated soils and ballast within the UPRR ROW along the Lakeshore south of Harrison are to be removed and properly disposed of. Sampling is currently being performed to determine the extent of removals, and also the need for potential sediment removals or other remediation for the wetlands in this area;. . ."
Correct, update, and amplify on this statement, to include:
- The fact that most of the ROW is a causeway on the lake bed, not "along the lakeshore".
- The recent (2000-2001) UPRR sample data from Harrison to Heyburn.
- UPRR has negotiated "physical boundaries" to limit proper removal. Discuss how significant contamination might be left in place.
- Wetlands is mentioned, BUT NO MENTION OF SAMPLING OR REMOVAL IS DISCUSSED FOR THE LAKE BED ITSELF. THE ENTIRE RI/FS IS INCOMPLETE AND INADEQUATE UNTILL THE LAKE BED SOILS ADJACENT THE KNOWN PRIMARY SOURCE OF CONTAMINATION, THE UPRR SUBEMBANKMENT, ARE SAMPLED AND RESPONSE ACTIONS ARE DISCUSSED!!
- ARSENIC, CADNIUM, AND ZINC MUST BE THOROUGHLY SAMPLED AND ANALYZED ALONG THIS ROW!!! THEY HAVE DIFFERENT PHYSICAL, CHEMICAL, AND RISK CHARACTERISTICS THAN LEAD!!!

Response Text

Arsenic, cadmium, lead, and zinc were all evaluated in the Streamlined Risk Assessment supporting the Wallace-Mullan Branch EE/CA.

2326 Draft — 2.0 — **1838**

Comment Text

Land owners from Harrison to Heyburn have physical evidence that the rail bed was changed in the early 20th century, possibly substantially. THE RI/FS IS NOT COMPLETE UNTIL EFFORTS TO LOCATE THE OLD ROW ARE COMPLETE, AND ANY ADDITIONAL CONTAMINATION, POSSIBLY IN THE LAKE BOTTOM, IS SAMPLED, ANALYZED, AND ACTION RESPONSES DISCUSSED.

Response Text

The EPA is not aware of this information from these landowners; however, EPA will consider all available data and will evaluate it for any appropriate actions.

2327 Draft — 5.4 — **1839**

Comment Text

The RI/FS needs a discussion of the effect of the artificial fluctuation of the lake by Avista, and the feasibility of keeping the lake at high level the entire year to minimize unfavorable chemical reactions during disruption by lowering the lake.

Response Text

See response to Comment #2302.

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Lower Coeur d'Alene River

4-CSM Unit 3, Lower Coeur d'Alene River

2321 Draft — 1.0 — **1833**

Comment Text

"Except for. . .the Union Pacific Railroad bed, which is being remediated under an agreement. . , there are no significant primary source areas in this watershed." Correct this statement. The bed is NOT being remediated. Explain why a thin asphalt cap, gravel cover, and vegetation are insufficient to prevent future introduction of contaminants from this acknowledged primary source, an elevated subembankment, into the adjacent wetlands and river channel. Explain, also, why the EE/CA said the RI/FS would discuss the UPRR ROW!

Response Text

See response to Comment #2298 and #2299.

2322 Draft — 2.1.6 — **1834**

Comment Text

Include a section on railroad history, and its contribution to distributing contamination, and how the subembankment forms a "hydraulic barrier".

Response Text

Additional text has been added to Part 1, Section 1.2.2 (Site History) to present information on the contribution of the UPRR ROW.

2323 Draft — 3.2.3.5 — **1835**

Comment Text

"From Springston to the State Route 95 bridge, the channel is constrained by a railroad grade on the southern side and is essentially linear." In appropriate sections, describe the "railroad grade" constraints along the numerous other segments of the River, and explain the implications for introduction of high levels of concentrations from the subembankment as evidenced by the recent (2000-2001) UPRR samples from Harrison to Heyburn. Also, explain the effect of these constraints on the amount of sediment delivered into Lake Coeur d'Alene.

Response Text

See response to Comment #2299.

*** No Watershed ***

0-Comment Pertaining to Entire Document

2289 Draft — General — **181**

Comment Text

Attached are CART's comments to the RI/FS. We expect them to be individually incorporated in the administrative record along with specific responses by EPA to each comment.

The comments were made in good faith after careful study, toward a more effective and comprehensive clean up of the basin, especially CSM 3 and the southern portion of CSM 4. Toward this end, we expect many of our comments to be discussed with us, seriously acted upon, and incorporated into the final RI/FS.

If you have any questions, please do not hesitate to ask.

Response Text

Individual responses are presented in this response to comment document and will be included in the Administrative Record..

2354 Draft — **211**

Comment Text

1) EPA DID NOT RESPOND TO ALL OF OUR COMMENTS. This fact negates Anne Dailey's statement in the July 20, 2001 letter that " We have written brief responses to all the comments received on the Draft RI."

The RI_DraftComments_Hardy.pdf EPA sent to us does not contain responses on our comments relating to:
DRAFT REMEDIAL INVESTIGATION PART 4, CSM UNIT 3
DRAFT REMEDIAL INVESTIGATION PART 5, CSM UNIT 4

Response Text

All comments received were included and responses were given for all comments. For the comments on the Draft RI Part 4 and Part 5, please see comment numbers 2321, 2322, 2323, 2324, 2325, 2326, and 2327.

The comments for the Draft FS are included in a separate database.

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DRAFT FEASIBILITY STUDY PART 1, OVERVIEW
DRAFT FEASIBILITY STUDY, PART 3, ECOLOGICAL ALTERNATIVES

These were contained in the same Word attachment 010411RI-FS Response.doc as the comments to which EPA did respond, so we are puzzled by these omissions. As our comments to RI PARTS 4 and 5 pertain to the Lake and Lower Basin specifically, your response is FATALLY FLAWED until they are included. 010411RI-FS Response.doc is re-attached to this email.

Also, EPA did not respond to our comments to the FS. We are confused. In the email of July 20, EPA interchangeably refers to the "RI", and the "RI/FS". When will EPA respond to the FS comments?

2355 Draft **212**

Comment Text

2) MANY EPA RESPONSES ARE INADEQUATE

Many EPA responses are vague and elusive, and give no idea specifically how the final RI will be edited to accommodate our comments. This will only cause problems for EPA later, as CART will carefully review the final RI/FS, and any remaining FATAL FLAWS that were pointed out in the draft stage will be attacked vigorously.

Response Text

EPA has dilligently worked to respond to all comments.

2356 Draft **213**

Comment Text

3) EPA STATED COMMITTMENTS (NOT FULFILLED IN THE PAST)

In response to some of our comments (2311, 2312, 2313), EPA made the following commitments:

"EPA recognizes the need to ensure coordination between the UPRR cleanup and the Basin RI/FS process, and will make further efforts to ensure opportunities for meaningful public involvement with both projects."
We note this is after-the-fact inclusion of our stakeholder participation. We protest adamantly the fact that our UPRR concerns were ignored until after the Governments had secured the CITU and Consent Decree agreements, thus insuring that our concerns and alternate scenarios were not considered. We protest strongly the fact that only the "do-nothing" and the "recreational trail as CERCLA response" scenarios were considered by EPA as alternatives for the UPRR ROW cleanup.
"EPA records management contractors have reviewed the Coeur d'Alene Basin record files such as at North Idaho College, and will make further efforts to assist local administrators with organization and maintenance."
We protest that this is more after-the-fact action by EPA. We protest again the fact that over half of the UPRR ROW Administrative Record is private and confidential. We protest again the fact that CART has been told to go to FOIA to get records, maps, correspondences requested from EPA that should have been readily available to the public.
"EPA will bring information and present briefings (at future meetings) as requested and appropriate."
EPA, again, is making an after-the-fact promise to the public. CART members have been consistently denied access to information requested from EPA. EPA, in fact, requires CART to go through a cumbersome process whereby we must submit any requests for information to Judy Bolis, hired by Union Pacific Railroad. After a month-long process involving confidential, closed conference calls among the Governments, answers may be sent to CART. Most often, the answers come too late (after-the-fact) or they are vague and non-specific. This is absolutely unacceptable, and we consider it a violation of EPA's duty to protect the public welfare and the environment.

Response Text

The UPRR ROW Administrative Record contains 605 documents, only 37 (6%) of which are designated confidential.

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To date, EPA has not honored the stated commitments. We hold EPA accountable for past violations of our rights as stakeholders. We will continue to register our complaints to national EPA Public Policy administrators.

2357 Draft **214**

Comment Text

Our comment 2325: We assert the RI/FS is incomplete and inadequate until CdA lake bed and wetland soils adjacent the UPRR subembankment are sampled, and we assert that arsenic, cadmium, and zinc must be more thoroughly studied. We further assert that the ROW is mischaracterized, since most of the ROW south of Harrison is a causeway in the lake, not "along the lakeshore." We assert, also, that UPRR-negotiated barriers to testing in the Consent Decree, called "physical boundaries", limit proper removal actions.

EPA response: "Arsenic, cadmium, lead, and zinc were all evaluated in the Streamlined Risk Assessment supporting the Wallace Mullan Branch EE/CA."

SPECIFIC FATAL FLAW FEEDBACK: EPA's curt non-answer evades entirely our assertions. The fact that the causeway is in the lake (SEA agreed with CART on this point) certainly presupposes that any RI will correct the mischaracterization and will predicate any cleanup on proper testing in those areas before any trail work proceeds. CART recalls that the Consent Decree promises "complete removals of all contaminants on the Reservation," and that a "post-removal level of 84 ppm lead for that area" is predicted. Yet EPA has not even properly identified nor tested those very areas where complete removals have been promised repeatedly. Further, the EE/CA Streamlined Risk Assessment data for the contaminants arsenic, cadmium and zinc were inadequate, and the same is true for the RI/FS. CART noted to EPA in comment 2325 that "arsenic, cadmium, zinc have different physical, chemical, and risk characteristics than lead." EPA has chosen to ignore this fact. Your response skirts our assertion that the RI/FS is an inadequate document upon which to base a ROD.

Response Text

More than 10,000 samples were collected to support the Remedial Investigation. These samples, combined with the 7,000 additional samples collected independently by IDEQ, USGS, the mining companies, EPA under other regulatory programs (e.g., NPDES), and others, provide a solid basis to support informed risk management decisions for the Coeur d'Alene Basin mining waste contamination. However, the large geographic area of the basin made it impractical to collect sufficient data to fully characterize each source area or watershed. Further data collection will be necessary to support remedial design for areas identified as requiring cleanup. This may include areas where previous cleanup actions have taken place, such as flood plain areas of the UPRR Right of Way or other areas where previous removal actions have addressed some, but not all, contamination present.

2358 Draft **215**

Comment Text

Our Comment 2236: We assert there is physical evidence that the UPRR ROW was relocated by Union Pacific within Lake CdA, so the RI/FS is incomplete until EPA locates the old UPRR ROW and samples to certify the lake bed is free of contaminants.

EPA response: "The EPA is not aware of this information fr m these landowners; h wever, EPA will consider all available data and will evaluate it for any appropriate actions.

SPECIFIC FATAL FLAW FEEDBACK: This response is evasive and alarming in its blatant denial that complete information about the historic ROW should have been examined carefully by the Governments long before any trail plans became reality. CART members have repeatedly requested (and been denied) old maps and information from the Governments, and indeed, evidence that the ROW moved is common knowledge and can be easily verified by looking at the pilings (old trestle) in Cal's Pond. CART members have repeatedly made these assertions to the Governments during the past several years. EPA should do its duty and get all ROW maps dating back to the original ROW placement (not just the present placement) from UPRR, and test former ROW beds for contamination. It is not private citizens' duty to do EPA's job for them. A comprehensive RI/FS and effective ROD cannot be finalized until EPA locates and samples these new possible sources of contamination, as well as any areas of historic derailments or spillage along the full 72-mile ROW.

Response Text

Based on information collected for the RI, EPA does not expect the ROD will "certify the lake bed is free of contaminants."

Discrete spills along the ROW have been identified and addressed according to plans approved by EPA and implemented by UPRR. If additional spills are discovered in the future, they may be addressed similarly.

2359 Draft **216**

Comment Text

Our Comment 2293: CART asserts more sampling of Cataldo should be done.

EPA response: "The EPA is not aware of data from John Picard; however, EPA will consider all available data and will evaluate it for any appropriate actions."

Response Text

Following the final ROD, EPA anticipates conducting extensive sampling of all residential areas within the Basin where mining contaminants may have come to be located, to determine the precise areas where

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SPECIFIC FATAL FLAW FEEDBACK: This resp nse is an evasive non-response that removes responsibility from EPA f r proper testing and removal of railroad waste. EPA knew or should have known about Mr. Pickard's levels since Mr. Picard's data were made public and submitted at the Ombudsman hearing on August 19, 2000. EPA attended that hearing, and EPA received copies of all testimony. It is not private citizens' duty to do the job for the EPA. EPA should do its duty and completely test all residential areas in the basin that have initial high contamination levels. A comprehensive RI/FS and effective ROD cannot be finalized until EPA locates and samples these new possible sources of contamination, most of which lie adjacent the UPRR ROW.

remedial actions are necessary to protect human health.

2360 Draft **217**

Comment Text

Our Comment 2294: We assert the sampling being performed on the UPRR ROW on Lake CdA should be included in the RI/FS.
EPA response "This work has not been completed as of publication of the RI. Text in the RI is current.
SPECIFIC FATAL FLAW FEEDBACK: This response illustrates how the RI will never be complete These data are significant findings that are relevant to wherever the UPRR ROW is a raised causeway throughout the basin. The final RI will NOT be current as soon as it is printed. CART asks:
WHAT IS THE MECHANISM TO INCORPORATE IMPORTANT NEW FINDINGS INTO THE ROD

Response Text

Information will be included in the Administrative Record for the ROD until the ROD is issued. Subsequent to the issuance of this ROD, new findings will be incorporated into remedial design, subsequent RODs or other actions.

2361 Draft **218**

Comment Text

Our comment 2295: EPA mischaracterizes the shore of Lake Coeur d'Alene as "a prime recreation area with many developed picnic and camping locations intermittently dispersed between communities." We asked EPA to state the percent of shoreline that is privately owned to put this quote in context.
EPA response: Text modified to remove "many developed
SPECIFIC FATAL FLAW FEEDBACK: EPA's response evades the fact that much of the lakeshore land is privately owned, undeveloped land with no public access, particularly south of Harrison. EPA's mischaracterization implies that the land is "recreational use, natural resource" land, as wrongly stated (and still uncorrected, in spite of CART's protestations) in the EE/CA, when in reality, every inch of land south of Harrison to Chatcolet is privately owned land. EPA's incorrect characterization serves to encourage trespassers, as well as to paint a false picture of the area.

Response Text

In characterizing land as "recreational," EPA takes no position on legal ownership or lawful public access, but does not encourage trespass on private land.

2362 Draft **219**

Comment Text

Our Comments 2298 and 2321: We assert the UPRR ROW plan is a wholly inadequate remediation, that the contamination left in place will continue to be introduced into the basin environment, and that the RI/FS should include acknowledgement and discussion of this issue.
EPA response: "Text modified to indicate that there are no significant "known" primary source areas in this Segment. Because this response action is being handled separately by the UPRR, IDEQ, the Coeur d'Alene Tribe, and EPA, additional details have not been added to this discussion."
SPECIFIC FATAL FLAW FEEDBACK: This is another response clearly exp sing EPA dysfunction and double-talk. The EPA is responsible in both response actions!!! These response actions should be one and the same, all areas held to the same standards of cleanup!!! The recent data from the Reservation testing plan shows, clearly, that the ROW below Harrison does not mimic the EPA model from "the Box" that formed the basis for the 72-mile removal and remediation plans for the UPRR ROW. The incredibly high, deep, and wide levels of railroad contamination revealed by the recent testing show that EPA must force Union Pacific to test and remove, test and remove, test and remove all along the ROW. EPA has endorsed unconscionable double standards for cleanup, based on a model that is no longer appropriate. The RI/FS is flawed and incomplete until this is corrected. The ROD cannot be

Response Text

The results of recent sampling of the ROW below Harrison are being specifically addressed within the implementation of the UPRR removal action.

More than 10,000 samples were collected to support the Remedial Investigation. These samples, combined with the 7,000 additional samples collected independently by IDEQ, USGS, the mining companies, EPA under other regulatory programs (e.g., NPDES), and others, provide a solid basis to support informed risk management decisions for the Coeur d'Alene Basin mining waste contamination. However, the large geographic area of the basin made it impractical to collect sufficient data to fully characterize each source area or watershed. Further data collection will be necessary to support remedial design for areas identified as requiring cleanup. This may include areas where previous cleanup actions have taken place, such as flood plain areas of the UPRR Right of Way or other areas where previous removal actions have addressed

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based on this document!!!

some, but not all, contamination present.

2363 Draft — **2110**

Comment Text

Our Comments 2299, 2296, 2301, 2303, 2304, 2305, 2306, 2320, 2321, 2324: We assert 1) There is insufficient data in the RI or the UPRR ROW EE/CA to support EPA statement that: "There are no significant primary sources of mining wastes in this segment (the lower basin). 2) The RI/FS and EE/CA each state that the other will address key issues, yet neither document does; this is double talk! 3) The new testing data between Harrison and Heyburn, 200-2001,should be included in the RI/FS. 4) High contamination levels at Harrison Beach are from railroad as well as river contamination.

EPA responses: "Cleanup actions f r the basin will be determined in the ROD These cleanup actions would apply to all areas of the basin including areas adjacent to the UPRR ROW."

"The UPRR cleanup actions to date have addressed the railroad grade ballast and the most highly contaminated concentrates as described in the EE/CA (MFG 1999). If in the future additional data become available and new risks are identified, appropriate actions will be taken."

SPECIFIC FATAL FLAW FEEDBACK: This blanket, vague response to many specific comments is wholly inadequate. Of course cleanup actions for the basin will be determined in the ROD. But the ROD will be inadequate and vigorously attacked unless all CART comments have been seriously considered, the RI/FS altered accordingly, and the ROD based on a more comprehensive RI/FS.

Response Text

The EE/CA actually states that contaminated areas within or connected to the ROW that are not addressed by the EE/CA will be addressed by the Basin RI/FS "and/or other response actions."

2364 Draft — **2111**

Comment Text

Our Comment 2300, 2303, 2304, 2305, 2306, 2314, 2320: We assert the 2000-2001 data collected along the UPRR ROW between Harrison and Heyburn is an invaluable model for other portions of the ROW in similar physical settings between Harrison and Mullan, and can indicate how much contamination is being introduced into the environment.

EPA response: "ROW data were collected in 2000-2001 to determine the location and volumes for s il removal Data were not intended for use in determining the relative contribution to the Coeur d'Alene Basin Environment."

SPECIFIC FATAL FLAW FEEDBACK: EPA does not respond to CART's asserti n that the new testing provides clear data that EPA's projections for where contamination "came to rest" are inaccurate. Regardless of the intent of the sampling, the RI/FS is incomplete and inadequate unless the data are incorporated into the database and the range of alternatives for cleanup action. To evade incorporating these data does not protect the public welfare or the environment. If EPA issues a ROD without including and considering these data, the document will be flawed, dangerous to the public, and vigorously attacked.

Response Text

EPA does not intend to " evade" the data from the ROW sampling but to seriously consider whether such data indicate any risk to human health and the environment that has not already been identified.

Also see response to Comment #2362.

2365 Draft — **2112**

Comment Text

Our Comment 2302, 2327, 2297: CART asks EPA to include a discussion of how the artificial fluctuation of the Lake promotes or impedes the conversion of sulfides to sulfates and oxides, and how this affects people and animals.

EPA response: EPA discusses the effect of fluctuation

SPECIFIC FATAL FLAW FEEDBACK: EPA does not indicate this discussion will be incorporated into the RI/FS. It should be, along with an expanded discussion of managing phosphate loading, since that now appears to be a major component in lake cleanup alternatives. EPA has now, clearly, "Mission-crept" into the lake, in spite of EPA assertions that the lake will neither be tested nor considered in relation to the UPRR cleanup alternatives. More EPA double-speak, and CART has steadfastly asserted that the lake must be a part of any basin plan, of which the UPRR (a causeway in the lake!) is a part. The RI/FS, if not amended, is neither adequate nor relevant to form the basis for the ROD.

Response Text

Post Falls Dam's regulation of water level in Coeur d'Alene Lake creates a 2.5-meter deep littoral area that is alternately dewatered during lake drawdown and inundated during lake filling. When not submerged by lake water, the surficial sediments in this littoral area are exposed to atmospheric oxygen. Depending on how well these lakebed sediments drain during drawdown, deeper sediment may also be exposed to oxygen. The combination of dewatering/inundation coupled with alternating episodes of exposure to oxygen could alter redox conditions within the sediments and affect the geochemical release or sequestration of trace metals; however, these processes are highly dependent on the depth penetration of oxygen into the lakebed sediments. Given

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that water levels in the lake have been managed in a similar fashion for nearly 100 years, the geochemical processes affecting sulfides in the nearshore zone have not changed appreciably.

2366 Draft — **2113**

Comment Text

Our Comment 2307, 2308: We assert the UPRR ROW is inadequately sampled, and more sampling should be undertaken.
EPA response: "Sampling eff rts conducted by the EPA from 1997 through 2000 to support the RI/FS are described in this section, not future sample collection efforts. Comment cannot be responded to."
SPECIFIC FATAL FLAW FEEDBACK This response if irrelevant, condescending and arrogant A ROD based on a RI/FS with so little data is inadequate. If the RI/FS has some form of publishing deadline, a clear mechanism should be in place for further work, and amendment capacity for the ROD. We don't see such a mechanism.

Response Text

If additional or different remedial actions are determined necessary for the Basin after the forthcoming ROD is final, EPA can conduct such actions through an Explanation of Significant Differences (ESD) or ROD amendment, both of which require public notice and have been done for the RODs for the Box. See National Contingency Plan at 40 C F R. 300.435(c)(2).

2367 Draft — **2114**

Comment Text

Our comment 2313: "EPA has accomplished the following: conducted or participated in dozens of public meetings and interviews in local communities."
Be open and honest about past and future actions on the UPRR ROW. Bring information and data to the meetings, and give briefings. Don't just sit around waiting for citizens t ask the right questions. Document all the meetings for UPRR, particularly those on the Reservation. Document why absolutely no OFM are discussed in public meetings.
EPA response: "EPA will bring informati n and present briefings as requested and appropriate Do not know what "OFM is s cannot respond."
SPECIFIC FATAL FLAW FEEDBACK: EPA uses the future tense, "will bring," yet EPA has failed miserably to do so in the past, particularly in reference to CART members. The public "informational" meetings have not included any serious discussion, data, or information about the many aspects of the UPRROW cleanup. CART members were excluded from the stated interviews which, according to EPA's handbook, are not only "appropriate", but mandatory under Superfund Amendments and Reauthorization Act (SARA). In fact, the EPA Community Relations handbook states that "the lead agency must designate a spokesperson at removal sites, who will inform the community of actions taken, respond to inquiries, and provide information concerning the release." This has not happened for CART members, although EPA acknowledged our stakeholder status. The handbook also states that the Community Relations Plan (CRP) must be prepared for removals longer than 45 days and that it must be based on community interviews. "EPA or State staff must conduct interviews with affected residents to determine their level of interest in the site, major concerns and issues, and information needs." CART members were not included in this process although we declared our interest many times. Further, SARA requires that "a transcript of the meeting conducted during the public comment period must be made available to the public and must be part of the administrative record." CART has requested all the responses to public comment (for and against the proposed trail), as well as the demographics of respondents, but EPA has said they are not available. "Public comment must be solicited on all
alternatives, not just the preferred alternative, and the information that supports the alternative." In the case of the UPRR ROW CERCLA response actions, only the do-nothing and the trail alternatives were discussed, and EPA consistently refused to even acknowledge CART's alternatives. The RI/FS is a flawed document because it is based on incomplete public input, and this is a violation of EPA public involvement policy. It follows, then, that the ROD is a fatally flawed document, since the exclusion of CART members, major stakeholders in the Basin cleanup, did not adhere to EPA policy.
In addition, how simple it would have been to e-mail directly to rogntonihardy@aol com, an address known well to Region 10

Response Text

EPA agrees that proper O & M is an important component for protecting human health and the environment in the CdA Basin. Mechanisms for providing O & M may be specified in the ROD or related documents, including a State Superfund contract as required by CERCLA Section 104(c).

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EPA, to ask what "OFM" meant. The typo should read "O and M", and in view of the astounding MOU between Union Pacific and Idaho Department of Parks and Recreation, made public in a July 24 Spokesman Review article, EPA is not involved in the current O and M agreement. This MOU rewards and encourages illegal and dangerous trespassing behavior by condoning trail use, even though "there still are not any allowable uses." EPA is not protecting the public welfare and the environment, and if EPA is not aware of the MOU, why not? This is, at best, another example of the lack of communication and lack of coordination among the Governments, and certainly the RI/FS should include direct discussion of O and M safety issues, as well as mechanisms for enforcing illegal behavior in a highly contaminated area. The ROD must also reflect consideration for these serious violations of O and M issues.

1-Setting and Methodology

2290 Draft | 1.0 | **182**

Comment Text

"To ensure opportunities for stakeholder involvement, EPA has prepared a Community Involvement Plan (USEPA, 1999), established an Administrative Record file and local information repositories, conducted or participated in dozens of public meetings and interviews in local communities, . . ." The UPRR Wallace-Mullan Branch Response Action, which lies in key portions of CSM Units 1, 2, 3, and 4, was specifically excluded from this process. It should be included this process and in all human health and ecological alternatives.

Response Text

Cleanup response actions on the UPRR ROW have been coordinated with IDEQ, the Coeur d'Alene Tribe, and EPA. Identified human health risks are being addressed. If new risks associated with these areas are identified in the future, responses will be developed to address these risks.

2291 Draft | 1.2.2 | **183**

Comment Text

The nature and extent of the UPRR Wallace-Mullan contamination should be described.

Response Text

Text added to Part 1 Section 1 2.2 describing the contamination along the UPRR ROW (as presented in the UPRR EE/CA).

2292 Draft | 1.2.3 | **184**

Comment Text

The documents supporting the UPRR and Governments Consent Decree, including the 1996 UPRR Conceptual Action Plan, and the 1999 EPA UPRR Wallace-Mullan Engineering Evaluation / Cost Analysis should be included and discussed.

Response Text

See response to Comment #2291.

2293 Draft | 1.2.4.12 | **185**

Comment Text

More yards in the Cataldo area adjacent the UPRR ROW should be sampled for contamination, as evidenced by the high levels in samples privately analyzed by Mr. John Picard.

Response Text

The EPA is not aware of data from John Picard; however, EPA will consider all available data and will evaluate it for any appropriate actions.

2294 Draft | 1.2.4.13 | **186**

Comment Text

Update sampling and "removal of contaminated soils and ballast" UPRR response actions, including record of public involvement "along the Lakeshore", South of Harrison.

Response Text

This work has not been completed as of publication of the RI. Text in the RI is current.

2295 Draft | 1.3 | **187**

Comment Text

"(The Lake) is a prime recreation area with many developed picnic and camping locations intermittently dispersed between communities." This is not a correct characterization of the land adjoining Lake Coeur d'Alene. State the percent of shoreline that is privately owned, to put this quote in context.

Response Text

Text modified to remove "many developed".

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1-Setting and Methodology				
2296	Draft	2.3.4	188	
Comment Text				**Response Text**
Discuss the data to prove that "There are no significant primary sources of mining wastes in this segment", in light of the recent (2000-2001) UPRR sample data along the UPRR ROW from Harrison to Heyburn. The two segments of the ROW have very similar characteristics. If they are different, and the ROW is not a significant contributor, show the data that supports this. Show data that proves the narrow asphalt cap and gravel and vegetation proposed for on top of the ROW will be an effective permeability barrier to preclude further contribution of contaminants from the ROW subembankment into the environment.				See response to Comment #2299.
2297	Draft	2.4 and 3.3.1.2	189	
Comment Text				**Response Text**
Discuss how the artificial fluctuation of the Coeur d'Alene Lake promotes or impedes the conversion of mine waste sulfides to sulfates and oxides, and the impact on receptibility to animals and humans.				See response to Comment #2302.
2298	Draft	2.4	1810	
Comment Text				**Response Text**
"Except for the UPRR bed, which is largely addressed under an agreement among" there are no significant primary source areas in CSM Unit 3". Include the data and discussion of alternatives addressed in that agreement, as the UPRR bed occupies a key part of the Basin, and is herein acknowledged as a "significant primary source area"				Text modified to indicate that there are no significant "known" primary source areas in this Segment. Because this response action is being handled separately by the UPRR, IDEQ, the Coeur d'Alene Tribe, and EPA, additional details have not been added to this discussion.
2299	Draft	2.4	1811	
Comment Text				**Response Text**
The 1999 EPA UPRR Wallace-Mullan Engineering Evaluation / Cost Analysis states on p. ES 7: "The EE/CA has not made a detailed evaluation of ecological risks; however, the recommended response actions are expected to be beneficial in mitigating ecological risks that may be associated with contaminants found within the ROW. Ecological risks that may exist throughout the Coeur d'Alene Basin will be evaluated and appropriately addressed as part of the ongoing Bunker Hill Basin Wide RI/FS and/or other response actions." The EE/CA specifically states the ROW WOULD BE COVERED IN THE ri/fs. This did NOT happen! The RI/FS says, instead, that the EE/CA covered the ROW. Discuss how this EE/CA "largely addresses the UPRR bed" in the context of this, and how it contains sufficient data and discussion of alternatives to be considered as a basis for this RI/FS.				Cleanup actions for the basin will be determined in the ROD. These cleanup actions would apply to all areas of the basin, including the UPRR ROW. The UPRR cleanup actions to date have included but are not limited to the railroad grade ballast and the most highly contaminated concentrates as described in the EE/CA (MFG 1999). If in the future, additional data become available and new risks are identified, appropriate actions will be taken.
2300	Draft	2.4	1812	
Comment Text				**Response Text**
The UPRR ROW subembankment in CSM 3 and CSM 4 have very similar characteristics. Discuss the subembankment contamination in CSM 3 in light of the recent (2000-2001) UPRR sample data along the UPRR ROW from Harrison to Heyburn. If they are different, and the ROW is not a significant contributor, show the data that supports this. Compare contamination levels in the subembankment with river and wetland soil levels. Show data that proves the narrow asphalt cap and gravel and vegetation proposed for on top of the ROW will be an effective permeability barrier to preclude further contribution of contaminants from the ROW subembankment into the environment.				ROW data were collected in 2000-2001 to determine the location and volumes for soil removal. Data were not intended for use in determining the relative contribution to the Coeur d'Alene Basin environment.
2301	Draft	2.5.1	1813	
Comment Text				**Response Text**
Rewrite this section in light of the recent (2000-2001) UPRR sample data. SAMPLE THE LAKE AND WETLANDS ADJACENT THE UPRR SUBEMBANKMENT, AND INCLUDE THESE DATA, DISCUSSION AND RESPONSE ALTERNATIVES IN THE FINAL RI/FS!				See response to Comment #2299.

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	* No Watershed *			
1-Setting and Methodology				
2302	Draft	2.5.1	1814	
Comment Text				**Response Text**
Discuss how the artificial fluctuation of the Coeur d'Alene Lake promotes or impedes the conversion of mine waste sulfides to sulfates and oxides, and the impact on receptibility to animals and humans.				Sediments transported down the Coeur d'Alene River are exposed to oxygenated river water. Therefore, sulfides will be converted to metal oxides and sulfates before entering Coeur d'Alene Lake. Fluctuating lake levels will periodically expose these same sediments to oxidizing and reducing conditions and tend to maintain the sediments in the form in which they entered the lake. Sediments deposited deeper in the lake and not impacted by lake fluctuations, will eventually be reduced (at depths > than approximately 4 to 5 cm in the sediment bottom profile) to sulfides which are more stable (less soluble) than the corresponding metal (lead, zinc, and cadmium) oxides or sulfates. Therefore, the fluctuating lake inhibits reduction of the metals in affected sediments relative to sediments that are continuously submerged. This is a simplification (see geochemistry discussion for details) as metals within 2 to 4 cm. below the sediment/water interface, are predominately associated (bound) with iron and metal oxides (Horowitz 1993) organic carbon, etc. The fluctuating lake levels will actually help maintain this condition as metal oxides of iron and manganese are not stable under reducing conditions that would result from continuously submerged sediments.
2303	Draft	2.1, 2.3, 2.4, 2.5	1815	
Comment Text		Figures 2.1-1, 2.1-2, 2.3-1, 2.4-12.5-1		**Response Text**
Include the input of contaminants from UPRR spillage in figures 2.1-1, 2.1-2, 2.3-1, 2.4-12.5-1, in light of recent (2000-2001) UPRR sample data.				See response to Comments #2299 and #2300.
2304	Draft		1816	
Comment Text				**Response Text**
Include the recent (2000-2001) UPRR sample data from Harrison to Heyburn as a model of typical contamination concentrations for the entire portion of the UPRR ROW from Plummer to Mullan where the ROW is composed of a subembankment.				See response to Comments #2299 and #2300.
2305	Draft	3.6.4	1817	
Comment Text				**Response Text**
Explain the high concentrations in recent (2000-2001) UPRR samples from Harrison to Heyburn affects the palustrine habitat of Lake Coeur d'Alene. Sample and analyze the palustrine habitat of this portion of the Lake. Prove with data that the statement ". . .at Harrison. . .deposition of either larger amounts of particles or larger particles has resulted in elevated metals concentrations in beach sediments." is from river deposition, and not rail car spillage, and is not true south of Harrison in light of this new data.				See response to Comments #2299 and #2300.
2306	Draft	4.1	1818	
Comment Text				**Response Text**
Include the recent (2000-2001) UPRR sample data from Harrison to Heyburn as a data model typical of the subembankment for the entire ROW from Plummer to Mullan.				See response to Comments #2299 and #2300.
2307	Draft	4.2.1	1819	
Comment Text				**Response Text**
Increase the number of judgmental sampling locations along the ROW, especially where a subembankment exists, to a density to				Sampling efforts conducted by the EPA from 1997 through 2000 to support the RI/FS

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*** No Watershed ***

1-Setting and Methodology

accurately characterize this "significant primary source area" for contamination acknowledged in section 2.4.

are described in this section, not future sample collection efforts. Comment cannot be responded to.

2308 Draft — 4.1 — **1820**

Comment Text — Table 4.1-1

Include all UPRR ROW past and future sampling reports as Historical Data Sources.

Response Text

See response to Comments #2307.

2309 Draft — 5.2 — **1821**

Comment Text

Some paragraphs are repeated in this section. EDIT!

Response Text

Text edited as appropriate.

2310 Draft — 5.2.1 — **1822**

Comment Text

Given the statement, "However, even deep samples could be contaminated from downward movement of metals leached from overlying mining-contaminated material.", sample the bases of the UPRR ROW subembankments, and determine degree of "primary source contribution" of contamination to the environment, and consider alternatives for response actions.

Response Text

See response to Comment #2309.

7-Summary

2311 Draft — 1.1 — **1823**

Comment Text

"EPA has accomplished the following: Prepared a Community Involvement Plan" The EPA has historically excluded CART from meaningful involvement, Start including the past and ongoing UPRR ROW "clean-up" in this involvement. The two cannot be separated.

Response Text

EPA recognizes the need to ensure coordination between the UPRR cleanup and the Basin RI/FS process, and will make further efforts to ensure opportunities for meaningful public involvement with both projects

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2312 Draft — 1.1 — **1824**

Comment Text

"EPA has accomplished the following: Established an Administrative Record file and local information repositories." Give the local administrators help on organizing the flood of stuff you are sending them. The repositories are a disorganized mess. DECLASSIFY THE UPRR REOCORD!!!

Response Text

EPA records management contractors have reviewed the Coeur d'Alene Basin record files such as at North Idaho College, and will make further efforts to assist local administrators with organization and maintenance.

2313 Draft — 1.1 — **1825**

Comment Text

"EPA has accomplished the following: conducted OR Participated in dozens of public meetings and interviews in local communities." Be open and honest about past and future actions on the UPRR ROW. Bring information and data to the meetings, and give briefings. Don't just sit around waiting for citizens to ask the right questions. Document all the meetings for UPRR, particularly those on the Reservation. Document WHY absolutely no OFM are discussed in public meetings.

Response Text

EPA will bring information and present briefings as requested and appropriate.

Do not know what "OFM" is so cannot respond.

2314 Draft — 1.1 — **1826**

Comment Text

"EPA has accomplished the following: Prepared and distributed fact sheets, and circulated for public review draft documents, such as numerous field sampling plans and the technical work plan for the bunker Hill Basin-Wide RI/FS 9SUEPA 1998)." PUBLISIZE the recent (2000-2001) UPRR samples from Harrison to Heyburn, and discuss how these results impact future estimates of the degree of contribution of contaminants from the UPRR ROW subembankment into the environment.

Response Text

See response to Comment #2300.

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Comment No.	Version	Subsection / Add'l Ref	Doc ID
* No Watershed *			
7-Summary			
2315	Draft	4.0	1827

Comment Text

"Surface water transport has distributed mining wastes throughout much of the alluvium along the South Fork, its tributaries, lateral lakes area, Coeur d'Alene Lake, and the Spokane River." Include the fact that UPRR distributed mining wastes in Coeur d'Alene Lake, as evidenced by the recent (2000-2001) UPRR samples from Harrison to Heyburn.

Response Text

Correct. Additional text has been added to Part 1, Section 1 2.2 (Site History) to present information on the contribution of the UPRR ROW.

2316	Draft	4.3	1828

Comment Text

Include a section on RAILROAD PRACTICES discussing their contribution to distributing contamination.

Response Text

See response to Comment #2315.

2317	Draft		1829

Comment Text

Numerous passages in the SUMMARY repeat passages in the SETTING AND METHODOLOGY section. This contributes to an overly cumbersome document, with the appearance of "padding", misusing taxpayers money.

Response Text

This summary by necessity repeats information from Parts 1 through 6 to give the reader an overview of findings. As much information as possible was condensed into tables and figures, with minimal text for ease of reading.

2318	Draft	4.5	1830

Comment Text

"Channel migration does not appear to be a significant source of sediment as the channel alignment has been relative(sic) constant through time." Explain WHY the channels don't migrate - man made levees, including the UPRR ROW, force the channel to stay put. Discuss effects of these levees on the amount of sediment that reaches Lake Coeur d'Alene, rather that settling out as overbank deposits in the chain lakes and wetlands. Discuss implications for future contamination distribution in the lake and Spokane River.

Response Text

Text modified to address comment.

2319	Draft	4.3	1831
		Table 4.3-2	

Comment Text

Include the railroad company practice of using tailings for railbeds.

Response Text

Text added to Section 4.3 to include use of tailings and waste rock as ballast.

2320	Draft	5.1.1	1832

Comment Text

Include railbed ballast and subembamkment as a category for analysis, and include all UPRR ROW data in the RI/FS.

Response Text

See response to Comments #2291, #2299 and #2300.

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Beaver Creek

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2103 Draft — 1.1 — **14126**

Comment Text

Page 1-1, Section 1.1 - the statement is made that "Active mining is occurring in the watershed at the Carlisle mine and mill site." This is not true.

Response Text

Text modified to remove this sentence. The Carlisle (Ray-Jefferson) mine and mill were shut down in the late 1950's. Small-scale, independent prospecting is happening in this watershed.

2104 Draft — 2 — **14127**

Comment Text

Page 2-4, second full paragraph - the statement is made that "the ore processing history of the Beaver Creek mines is also unclear"(emphasis added). It is important to clarify that only ore mining and beneficiation occurred in the Beaver Creek watershed. "Processing" is a technical & regulatory term exclusive to specific activities that would occur at either the Bunker Hill smelter or zinc plant operations. Therefore, the use of the term "processing" or "process wastes" should not be used.

Response Text

The sentence has been modified.

2105 Draft — 2 — **14128**

Comment Text

Page 2-4, third full paragraph - the statement is made that "Tailings production for the watershed has been estimated at nearly 2 million tons (SAIC 1993)." This statement is misleading in that it tells the reader that 2 million tons of tailings were dumped into streams. Although a footnote to Table 2.1-1 states that "Estimated tailings produced by each mine were not necessarily disposed within the reach where the ores were mined", this should be stated up front in the narrative as well. Likewise, no mention is made of the Carlisle tailings pond. The RI has identified potential mines with mills and is aware of the Carlisle tailings ponds. From this information, an effort should be made to estimate tailings actually deposited into the streams. To equate imaginary tailings and impounded tailings with tailings deposited into a stream is simply improper.

Response Text

The paragraph has been modified for clarity.

2106 Draft — 2 — **14129**

Comment Text

Page 2-4, first paragraph of Section 2 1.6 1 - we do not understand the phrase ". . . in which the mine is (or was) located". Either a mine was there or it was not there.

Response Text

Text revised to respond to comment.

2107 Draft — 2.1.6.2 — **14130**

Comment Text

Page 2-5, Section 2 1.6 2 - If a mill is known to have existed, it should be identified even though records are not available. No assumption should be made that a mill existed just because a mine did, as many mines did not have mills.

Response Text

Text modified to include the Jenkins Prospect and the Kenan Group Adjacent millsites.

2108 Draft — 2.2.2 — **14131**

Comment Text

Page 2-6, Section 2.2.2 and page 2-7, first partial paragraph - a comparison of the aquifers of Beaver Creek with Smelterville Flats and Canyon/Ninemile Creeks is made without the requisite technical studies allegedly because "it is reasonable to expect" and "is probably comparable". Absent a thorough investigation of faults, substrate, near-surface mineralization, etc. such broad assumptions are only speculative at best.

Response Text

Due to the large geographic area included in this RI/FS, it was not practical to collect samples from all areas. For areas without site-specific information, drawing general conclusions from reviews of available data on similar systems is a reasonable approach.

2109 Draft — **14132**

Comment Text

Page 3-1, second full paragraph - a description of human activities that may cause sedimentation is given. Any honest evaluation of net sedimentation due to human activities would include fire suppression. The "human activity" of fire suppression represents a

Response Text

The reviewer's comment is appreciated. Fire suppression and thinning may reduce the damage due to forest fires and associated devegetation and may result in decreasing

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2-CSM Unit 1, Upper Watersheds

significant potential reduction of sedimentation to streams. The U.S. Forest Service is fully aware, or should be, of sedimentation rates from burned areas. Further, the U.S. Forest Service is aware of, or should be aware of, acres of forest saved from fire suppression actions. It is quite tiring to continually be confronted with documentation alleging only the negative side of human activities on our public and private lands.

overall sedimentation to the system from future fires.

2110 Draft | 3 | **14133**

Comment Text

Page 3-1, last paragraph - the statement is made concerning "Logging and drill exploration roads" as potential sedimentation sources. We are not aware of any "drill exploration" occurring in this area for decades. All such historic drill roads are either overgrown or used for other purposes. The RI should clarify whether or not there is any current exploration drilling. This can be accomplished by reviewing exploration notifications required by the Idaho Department of Lands (IDL). The IDL records would certainly constitute "available information" allegedly reviewed by the final paragraph on page 3-3.

Response Text

Many of the roads throughout the watershed were originally constructed for the timber and mining industries for exploration and transport of resources. They may not be currently used for such purposes; however, the original purpose of these roads was likely for logging and drill exploration. We are not aware of any current exploration drilling. The text has been modified.

2111 Draft | 4.1 | **14134**

Comment Text

Page 4-1, Section 4 1, second paragraph - the statement is made that "Historical and recent investigations at areas within the study area are listed and summarized in Part I, Section 4." The list of investigations does not include either the "CANYON CREEK-WOODLAND PARK RESPONSE ACTION 1995-1996 TAILINGS REMOVAL AND STREAM- FLOODPLAIN STABILIZATION WORK PLAN" (June 7, 1995) or the "REMOVAL WORK PLAN FOR 1994 NINEMILE DRAINAGE PROJECTS" (MFG, May 10, 1994). The point being that the draft RI for Beaver Creek makes comparisons, due to lack of specific watershed data for the Beaver Creek drainage, with Prichard, Canyon, and Ninemile Creeks. The draft RI for Beaver Creek should also mention the natural mineralization that can and does occur in similar drainages and use the above-mentioned studies as supporting documentation. In addition, pre-mining mineralization in other mining areas, such as the Red Dog Mine area, should be pointed out as an example of naturally occurring levels of metals. To ignore this fact is to ignore the reality of mineralized areas.

Response Text

Section 4 includes results for soil/sediment and surface water samples collected only from areas in the Beaver Creek watershed segment as shown in Figures 4.1-1 and 4.1-2. Comparisons are not made in this section to sampling results from any other watershed. Where other sections in this watershed report reference physical parameters measured in other watersheds, the references are cited.

2112 Draft | 4.1.4.1 | **14135**

Comment Text

Page 4-2, Section 4.1.4.1 - this section indicates that "Ten surface soil samples were collected and analyzed for total metals. . . " The actual locations of these 10 samples should be explained and qualified in the narrative as well. It is misleading to the public to equate samples taken from either a tailings impoundment or mine "waste rock" on private property with a sample taken in steambed sediments. The difference is that in one instance, exposure to the metals contained in the solids requires illegal trespass on private property. "Screening levels", as presented in the draft RI, are not appropriate for mine sites on private property.

Response Text

Location types (adits, seeps, tailings, etc) for each sample are identified with individual sample results in Attachment 2. As a new portion of this attachment, specific samples and their location types are identified for each source area that was sampled.

Selected screening levels used in the RI are used for initial evaluation of metals concentrations to identify areas for further evaluation in the FS. Cleanup levels or action levels for specific source areas will be identified in the ROD.

Concentrations of metals can pose risks of exposure to the environment or to persons whether or not authorized to be on any partcular private property.

2113 Draft | 4.2.2.1 | **14136**

Comment Text

Page 4-4, Sections 4.2.2.1 & 4.2.2.2 mention "pond" and "lake" loads. It appears that at least one of these "pond" or "lake" sources is standing water within the Carlisle tailings impoundment. We are not aware of any scientifically valid method by which an analysis of standing water in an impoundment can be equated to a "mass loading" to Beaver Creek.

Response Text

As shown in Table 4.2-1, loads were not calculated for seep, adit or lake locations because there is no measurable discharge.

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2114 Draft — 4.2 — **14137**

Comment Text (Table 4.2-1)

Table 4 2-1 - it is not clear why a dissolved zinc "mass load" for "BV1" was not calculated. The Data Summary Table (pages 1 & 2) contains analysis results for dissolved zinc for 5 May 1998.

Response Text

A mass load for "BV1" included in Table 4.2-1.

2115 Draft — 5.2 — **14138**

Comment Text

Page 5-1, Section 5.2 - this section describes the "paucity of data at individual sampling locations" which voided probabilistic modeling. Sampling did not meet the typical sampling of 10 events, and did not even meet the "reduced criterion of 5 or more sampling events". It appears that there is not sufficient data to draw conclusions; the speculations are inappropriate.

Response Text

Is the reviewer referring to the statement that "Concentrations of metals in the upper part of Beaver Creek are likely to cause harm to aquatic life—" Based on measured zinc concentrations of up to 1,650 ug/L (criterion of 30 ug/L), this is a reasonable statement. Conclusions in this section are drawn from reported measurements, not from modeling.

2116 Draft — 5.3 — **14139**

Comment Text

Page 5-2, Section 5.3 - the statement is made that "Based on review of aerial photographs, sediment sources in Beaver Creek are mining wastes, mobilization of channel bed sediment, bank erosion, and rock debris and tailings piles situated adjacent to channels." This is quite remarkable to state what the sediment sources "are" from aerial photographs and with no sediment analysis in the data set! If the aerial photograph review concluded, for example, that the tailings in the Carlisle impoundment is a source of sediment, then this is simply wrong. Further, it is our experience that historic mine waste dumps are very stable and do not actively erode. This section requires actual monitoring data of sufficient quality/quantity to identify true sediment sources.

Response Text

"Potential" added to text.

2117 Draft — 5.4 — **14140**

Comment Text

Page 5-3, second paragraph, second sentence - it is stated that "The dissolved zinc load was the only parameter to exceed total maximum daily loads (TMDLs) established for the North Fork at Enaville." The only TMDL we are aware of with "established" loads for dissolved zinc is the TMDL approved by EPA in August 2000; this TMDL does not have loads assigned to the North Fork of the Coeur d'Alene River so we are not sure what is meant by this statement.

Response Text

The "Loading Capacity" was used as found in column 3 of Table 6-9 on page 31 (EPA, August 2000 Final). The referenced table in entitled "Available Loading Capacity for Dissolved Zinc." Station # is NF400.

2118 Draft — 5.1 — **14141**

Comment Text (Table 5-1)

Table 5-1 lists minimum and maximum concentrations of an entire data set of analysis results for lead, zinc, and cadmium without differentiating between sources. This procedure grossly exaggerates the data by equating relatively low concentration/high flows of a stream with higher concentration/low (even unmeasureable) flows! While the commentary at Section 5.4 admits this bias, an explanation is not provided regarding the obvious and avoidable reason, i.e. explain and separate the sources. The disparity in the data sources is clearly shown in the draft RI in Table 4.2-1. The highest concentrations are found in the "Adits, Seeps and Pond Sampling" but all flows are "<" (less than) values. Indeed, the BV8147 "LK" sample is standing water in a tailings impoundment and is not a load to Beaver Creek at all!

Response Text

Table 5-1 revised to only include results for samples from location type "RV". Lake, seep, and adit samples without measurable flow results were removed.

2119 Draft — **14142**

Comment Text

The problems identified in the above comment concerning Table 5-1 result in the bogus numbers presented in Table 5-2. After erroneously equating the analysis data set, the "Calculated Average Discharge in cfs"(emphasis added) in Table 5-2 of 100 cfs for Beaver Creek flow (at the mouth?) results in a dissolved zinc loading of 334 pounds/day. In stark contrast, the analytical facts of the

Response Text

Data sources will be differentiated as explained in the previous response (#2119).

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measured real world data presented in both Table 4.2-1 and the Data Summary Table for BV1 (mouth of Beaver Creek) shows that at a flow of 85.6 cfs, when coupled with the analysis results of 48 ?g/L zinc, results in an actual measured load of approximately 22 pounds/day of zinc! The R1 should be based on sound data and proper analysis of the data, not conjecture and manipulation.

Canyon Creek

2-CSM Unit 1, Upper Watersheds

2026 Draft 1 **1449**

Comment Text

Page 1-1, first paragraph - the draft RI states "The watershed has been affected by mining activities and hazardous substances have been and continue to be released into the environment." Virtually all of the "releases" are due to "past" activities of discharging tailings directly to the stream. These "releases" occurred solely upon discharge from the mill(s) and the water quality now exhibited in the stream(s) is the result of the past "releases". Here, again, the RI is treading into political and legal arguments, rather than being a science-based document.

Response Text

EPA is concerned not only about releases from past mining practices but present and future releases from secondary sources such as riverbeds and riverbanks.

2027 Draft 1 **1450**

Comment Text

Page 1-1, second paragraph - the draft RI mentions "...several time-critical removal actions…" conducted in the watershed. The RI must clearly indicate which removals were and were not "time-critical" rather than inferring all removal actions were "time-critical". For example, the major removal action in the watershed to date, the Woodland Park area and sites above, were part of a "non-time critical" removal as evidenced by an EPA memo dated 28 July 1995 from Earl Liverman (EPA) to Randall Smith (EPA). Indeed, an engineering evaluation/cost analysis (EE/CA) was prepared for this removal action. An EE/CA is not required for "time-critical" removals.

Response Text

References to time-critical removals deleted.

2028 Draft 1 **1451**

Comment Text

Page 1-1, second paragraph, last sentence - the draft RI states "Recent monitoring by USGS indicates a plume of metals contaminated groundwater down-gradient from this repository (Box 1999)." How exactly does this report verify that this "plume" is from the repository? A brief explanation of the "Box 1999" conclusions is warranted within the RI. Certain groundwater monitoring wells are located near the stream channel with resultant groundwater depths of only a few feet. With an estimated 600,000 cubic yards of material removed from the Canyon Creek floodplain over the past few years, it is highly unlikely that any conclusions can be drawn prior to post-removal stabilization of the system. Besides, the objective of the removal actions was to improve surface water quality and habitat. These removal actions must be evaluated on a net benefit basis.

Response Text

See response to Comment #1949.

2029 Draft 1 **1452**

Comment Text

Page 1-2, first paragraph of Section 1.1 - it is noted that there are ".. 19 mining-related sites..." in Segment 1 "...however, Canyon Creek does not receive significant metals input from this segment." Further, an additional 13 sites downstream in Segment 2, for a total of 32 "BLM identified" mining-related source areas, do "not contribute significantly to metals loading to the Coeur d'Alene River system." It is important to note that the mere existence of past mining activity does not automatically equate with a problem. Other sections of the draft RI appear to conclude, without any evidence, that all mining sites "are" sources. Segments 1 and 2 on Canyon Creek contained no operating mills, thus no tailings remnants in the floodplain materials. In contrast, increased metal loads observed in the mainstem Coeur d'Alene River, where virtually no mining activities occurred, are due almost exclusively to tailings

Response Text

The source areas identified by the BLM are included in the RI as a base for identifying potential sources of metals to the watershed. The RI does not imply that all mining sites are sources, but that they are potential sources needing further evaluation. The identification of major source areas was initially presented in FS Technical Memorandum No.1. This list of major source areas was developed from review of existing site data and observed surface water zinc concentrations. This list may be refined during the proposed plan and ROD development.

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in floodplain materials (in addition to a natural background component, stormwater runoff also contributes metals to the mainstem). In addition, while natural background levels of metals in Segments 1 and 2 may be influenced by natural sources, these Segments are not as highly mineralized as downstream Segments of Canyon Creek where the bulk of mining production occurred. Natural background levels (within streambed materials and associated with fault areas) would obviously be higher in these downstream Segments.

2030 Draft | 1 | **1453**

Comment Text

Page 1-2, third paragraph of Section 1.1 - while there are 17 "BLM identified" source areas in Segment 3 (Gorge Gulch), Gorge Gulch is not a functional perennial stream due to both low summer flows (which leave certain reaches dry) and physical barriers. Results of the MFG 1991 low flow sampling event, when Canyon Creek stream metal concentrations are highest, shows that zinc from Gorge Gulch is only 0.006% of the total zinc load from Canyon Creek. Gorge Gulch does not appear to be a problem.

Response Text

Agree, this is why no source areas have been identified in this segment for further evaluation.

2031 Draft | 2 | **1454**

Comment Text

Page 2-4, second paragraph of Section 2.1.6 - we believe that mining last occurred in 1990 when Star-Phoenix ceased operations.

Response Text

The date has been changed to 1990.

2032 Draft | 2 | **1455**

Comment Text

Page 2-4, last paragraph - we are confused with the phrase "...the mine is (or was) located." Is this intended to differentiate between active and inactive mines? If not, this doesn't make sense. If a mine is developed in a location, then the location never changes.

Response Text

The words "(or was)" have been deleted

2033 Draft | 2 | **1456**

Comment Text

Page 2-6, fourth paragraph - the Tamarack #7 also drains groundwater from the Standard-Mammoth mine.

Response Text

The paragraph acknowledges the connection to the Standard-Mammoth workings; however a sentence has been added for clarification.

2034 Draft | 2 | **1457**

Comment Text

Page 2-6, last paragraph - is the 1991 "Measured flow from the tailings ponds" from the MFG 1991 low flow study? If so, we believe that MFG measured accumulated ditch water (mixed surface water, ground water, and pond discharge), a common mistake due to the location of the Parshall flume, and attributed all this flow to pond discharge. Actual discharge from the pond pipe is closer to 0.33 cfs.

Response Text

The 1991 MFG results presented in the SAIC 1993 document referenced here were for seep CC19. Results were 0.94 cfs for October 1991, and 1 1 for May 1991. Seep CC19 is located on the river side on the southeast side of the tailings pond #6. For outfall CC811, located at the base of tailings pond #6, the range of measured flows was from approximately 1 to 3 cfs. Data from the outfall added to this discussion.

2035 Draft | 2 | **1458**

Comment Text

Page 2-6, last sentence - the statement is made that "It is probable that tailings ponds were built over the stream channel, in which case subsurface flow through the tailings impoundments is possible." What is the basis for this statement? Stream channel relocation was not required for the construction of any of the six Star tailings impoundments. Further, some of the tailings ponds were lined with clay.

Response Text

The sentence has been modified.

2036 Draft | 2 | **1459**

Comment Text

Page 2-7, first paragraph - it should be noted that a municipal landfill was also located in the Woodland Park floodplain subsequent

Response Text

The information about the private landfill in lower Canyon Creek is not pertinent to the

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to the failure of the plank dam.				section.
2037	Draft	2	**1460**	
Comment Text				**Response Text**
Page 2-7, second paragraph, last sentence, under Section 2.2 - the draft RI mentions "..mine workings that may have some influence on groundwater." Geologic faults also provide a pathway from groundwater through natural mineralization. This fact is briefly recognized in the previous sentence and Section 2.2.3.2 on page 2-11, but the potential for metals in fault water is not mentioned. The numerous faults in the entire drainage, which also may influence groundwater, should be described.				The non-mining related sources of metals listed in the comment contribute to the background concentrations of metals observed in surface water. By using the background concentrations in conjunction with risk-based screening levels, locations with background concentrations of metals or less are screened out from further evaluation in the RI/FS process.
2038	Draft	2	**1461**	
Comment Text				**Response Text**
Page 2-9, first paragraph - slug tests were only "... performed in 14 monitoring wells..." during a low flow period (December 1999). Similar tests must be performed during high flow conditions to evaluate groundwater/surface water interactions. Groundwater elevations would increase, affecting both hydraulic conductivity and groundwater quality. Seasonality must be a discussion topic on groundwater conditions.				Groundwater/surface water interactions may be studied if needed to support remedial design.
2039	Draft	2	**1462**	
Comment Text				**Response Text**
Page 2-12, first paragraph, third sentence - "...accumulations of alluvium/tailings..." should more clearly be described as "...accumulations of alluvium and alluvium mixed with tailings..." Tailings are not always associated with alluvium in the Canyon Creek system.				Text modified as per comment.
2040	Draft	2	**1463**	
Comment Text				**Response Text**
Page 2-12, second paragraph - the statement is made that there is a slight increase in surface water flow "...adjacent to the Hecla-Star Tailings Ponds. The tailings ponds serve as settling ponds for mine drainage from the Star Mine." The draft RI then speculates that "It is likely that the slight but measurable increase in Canyon Creek flow is attributable to the infiltration of mine drainage water through the Hecla-Star Tailings Ponds..." There is only one pond receiving groundwater from the mine and this pond is the furthest downgradient (Pond #6). In fact, this is verified in the draft RI in the last paragraph on page 2-6. Further, the draft RI makes like comparisons of the aquifer/groundwater characteristics of Ninemile Creek and Canyon Creek but, according to the MFG 1991 low flow study, the lower reaches of Ninemile Creek show a much greater flow increase (as a percentage) without tailings ponds than is shown in the lower reaches of Canyon Creek. Please explain the source of this information and the location and dates of the site flow measurements.				This paragraph has been deleted and replaced with a summary of the USGS seepage study (Barton 2000). The seepage study indicated that surface water/groundwater interactions in this area are very complex and shift depending on stream discharge or other parameters.
2041	Draft	2	**1464**	
Comment Text				**Response Text**
Page 2-13, Section 2 2.4 - the following discussions must be added to this section on "Groundwater Quality and Chemistry": 1) depth to groundwater at each location, 2) levels of metals at each location, 3) discussion of remediation activities, and corresponding dates, upgradient of each well site that would make comparisons of monitoring data from differing years impossible, and 4) how seasonality (high vs. 1ow flow periods) affects groundwater quality, elevations, and hydraulic conductivity.				Available groundwater information is presented in this section. Additional groundwater data would need to be gathered to address this comment. Additional sampling for the RI is not planned at this time; however, additional groundwater data will need to be gathered to support remedial design.

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Canyon Creek

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2042 Draft | 2 | **1465**

Comment Text

Page 2-16, first paragraph under Section 2.3.2.1 - discussions of the "overestimates", of discharge on Canyon Creek due to Placer Creek comparisons is "about 20 percent" for the "peak daily discharge". Is this meant to be the "peak daily mean discharge" as was done for Ninemile Creek? If not, why weren't the same conditions used on both Ninemile and Canyon Creeks? Also, if not, what percent overestimate is made on Canyon Creek for the peak daily mean discharge? In addition, it would also be helpful to indicate % areas in each drainage (Placer & Canyon) above certain elevations (i e. at 1000 ft intervals - higher % in higher elevations would indicate a slower and more sustained release of snow melt).

What is the calculated mean daily discharge for Canyon Creek?

Response Text

Text has been modified to refer to mean peak daily discharge. Many parameters influence the rate of snowmelt including elevation, vegetation cover, basin orientation among others. Providing detailed tables for each conceivable variable is unnecessary to provide estimates of discharge. The mean daily discharge for Canyon Creek is approximately 50 cfs.

2043 Draft | 2.1 | **1466**

Comment Text | Figure 2.1-1

Figure 2.1-1 - "Helca" misspelling and this is not a "tailings pile"; it is a tailings impoundment under the jurisdiction of the Idaho Department of Water Resources (IDWR), the discharge from which is subject to a NPDES permit. In addition, the "tailings repository" drawing is misleading. The construction was completed to bring the repository elevation well above the 100 year floodplain. The "CANYON CREEK - WOODLAND PARK RESPONSE ACTION 1995-1996 TAILINGS REMOVAL AND STREAM-FLOODPLAIN STABILIZATION WORK PLAN"(June 7, 1995) details the repository and is readily available to EPA as EPA was a participant in this removal action.

Response Text

Names revised.

The elevation of monitoring well CC1494 (located in the floodplain just down-gradient from the repository) at ground surface is 2,902 ft above msl. Based on the relative distances presented in Figure 2.1-1, this would place the repository base at approximately 2,940 above msl, which is not inconsistent with the comment about the base of the repository being above the 100 year floodplain.

2044 Draft | 2.1 | **1467**

Comment Text | Figure 2.1-2

Figure 2 1-2 - we believe the Tamarack No. 7 waste rock area also contains waste rock from the Standard-Mammoth mine.

Response Text

Comment acknowledged, however, figure is not intended to indicate the source of the waste rock.

2045 Draft | 2.1 | **1468**

Comment Text | Table 2.1-2

Table 2 1-2 - the Star mill ceased operations in 1990 when Star-Phoenix abandoned the property.

Response Text

The table has been edited to reflect a 1990 closure date for the Star mill.

2046 Draft | 2.2 | **1469**

Comment Text | Table 2.2-1

Table 2.2-1 - as previously mentioned, slug tests must also be conducted during high flow events.

Response Text

Available groundwater information is presented in this section. Additional groundwater data would need to be gathered to address this comment. Additional sampling for the RI is not planned at this time; however, additional groundwater data will need to be gathered to support remedial design.

2047 Draft | 2.2 | **1470**

Comment Text | Table 2.2-2

Table 2.2-2 - it would be helpful if metals levels were included in this table especially with depth ranges of 8 to 134 feet for the wells.

Response Text

Dissolved zinc concentrations added to Table 2.2-2. Dissolved zinc was not correlated with any of the other water quality parameters reported.

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2048 Draft — 2.2Table 2.2-4. — **1471**

Comment Text

Table 2.2-4 - well depth should be included in this table.

Response Text

Well depth information from MFG 1998 report added.

2049 Draft — 2.3 — **1472**

Comment Text — Table 2.3-3.

Table 2.3-3 - it would be helpful to provide the snow to precipitation conversion factor as a footnote to the table.

Response Text

A general conversion factor is not appropriate, as different snowfall events contain different amounts of water.

2050 Draft — 3 — **1473**

Comment Text

Page 3-1, first paragraph - it should be clarified that the "sediment sources" are "potential sediment sources". Not all mine waste rock areas are sediment sources and it has been our experience that historic mine waste rock areas are stable. For example, TSS results for the 1991 MFG high flow study for samples collected on Canyon Creek above and below the Tamarack No. 7 waste rock area shows that TSS levels were actually lower below the waste rock area.

Response Text

It may be that the reviewer's experience that historical mine waste rock areas are stable; however, these areas weather, erode, or may become unstable over time. As such, these areas constitute a potential sediment source to the system.

2051 Draft — 3 — **1474**

Comment Text

Page 3-1, first paragraph of Section 3.1 - the statement is made that "Data from seven suspended load and five bedload sampling events are available from three storm events " What were the dates of these events and the actual measured flows and sample results? According to Figure 3.2-1, it appears that the lowest measured flow during a sampling event was approximately 60 cfs. From the measured Canyon Creek flows on Figure 2.3.4, it appears that the majority of days in the 1999 water year, a typical water year, this flow is not exceeded a majority of the time.

At what flow are either bedload or suspended loads "unmeasureable" based on the sampling procedure?

It is stated that ". . . sampling was completed on both the rising and falling limbs of high water events to examine the transport during these differing conditions " What were the results? How, for example, does the load of both metals and sediment compare for a 60 cfs flow on the rising limb vs. a 60 cfs flow on the falling limb of the hydrograph? Shouldn't all past monitoring data events be separated according to rising/falling/steady-state flow conditions so as not to distort the results? For example, the 1991 MFG high flow study showed stream discharge at the mouth of Canyon Creek of approximately 175 cfs with a TSS reading of 0.7 mg/L. This is roughly 0.33 tons/day whereas the associated fines on Figure 3.2-1 for a 175 cfs flow shows over 2 tons/day fines.

Response Text

Eight USGS gaging stations were sampled for suspended and bedload sediments under baseflow, low, moderate, and high discharge conditions between February 1999 and April 2000. Measured flows and sample results are plotted on the charts in Clark and Woods. 2000. Transport of Suspended and Bedload Sediment at Eight Stations in the Coeur d'Alene River Basin, Idaho.

The lowest measured discharge during a sampling event was 34 cfs. The reviewer makes a good point that most days the discharge is less than 34 cfs. Very little sediment transport occurs at these small discharges. Most sediment movement occurs during storm or snowmelt events. Channel geometry and discharge both impact the lower threshold of sediment transport. In this case, the lower threshold is less that 34 cfs. This analysis averaged the results to provide an overall estimate for both the rising and falling limbs.

2052 Draft — 3 — **1475**

Comment Text

Page 3-1, second paragraph under Section 3 1 - If the mean daily flow is used, rather than actual daily flows, how does this distort actual sediment transport? There is a flow level at which there is virtually no sediment transport.

An additional consideration which deserves mention in the text is the potential additional sediment contribution associated with recent remediation efforts that will occur until the system stabilizes.

Response Text

Mean daily discharges for each day of the year were used to estimate sediment transport. If the annual mean daily flow were used, this would significantly reduce the estimate of sediment discharge. This would be inappropriate because most of the sediment is moved during relatively short periods of high discharge. As indicated on page 3-4, McBain and Trush found that there was threshold at about 25 cfs where sediment movement began to increase.

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2053 Draft | 3 | **1476**

Comment Text

Page 3-2, first paragraph - it is stated that "The USGS sediment transport data were analyzed in general accordance with the U.S. Army Corps of Engineers (USACE guidance manual for sedimentation investigations (USACE 1989)." (emphasis added) How did the USGS data analysis differ from this guidance and how does this affect the outcome?

Response Text

The USGS analyses to calculate sediment rating curves were identical to the analyses completed for the RI. The analyses for the RI included the calculation of sediment yield. Outcomes were not affected.

2054 Draft | 3 | **1477**

Comment Text

Page 3-2, fourth paragraph - it is estimated that 60 tons per square mile (@21.9 square miles), or 1314 tons of sediment were discharged at the mouth of Canyon Creek in water year 1999. Approximately 61% (788 tons) of this total were fines. As mentioned above, the MFG 1991 high flow sampling event showed 175 cfs at the mouth of Canyon Creek and 0.33 tons/day of TSS. Figure 2.3-4 indicates that less than 30 days ever exceeded this flow in water year 1999 and that most days of the year the flow was well below even 75 cfs. Even if the daily Canyon Creek discharge was 175 cfs, this still only results in about 120 tons/year TSS. There evidently is not enough information provided in the RI discussion of sediment yield to explain the apparent gross overestimate of sediment yield.

Response Text

The suspended sediment samples collected by the USGS were obtained using depth and width integrating procedures. These techniques provide a representative sample of suspended sediment load occurring throughout the cross section. Typically water quality samples for TSS are grab samples taken in one location near the edge of the channel. The method the USGS used gives a much more complete estimate of the quantity of suspended sediment.

2055 Draft | 3 | **1478**

Comment Text

Page 3-3, fourth paragraph - the "overestimate" of 20% stated in narrative should be added as a footnote on Table 3.2-1.

Response Text

A description of estimates is already provided in the text

2056 Draft | 3 | **1479**

Comment Text

Page 3-7, second paragraph - we do not believe there was a mill located at the Marsh mine site. Also, Table 2.1-2 of the draft RI does not identify a mill at this site.

Response Text

Text modified as per comment.

2057 Draft | 3 | **1480**

Comment Text

Page 3-7, first paragraph under Section 3.2.3.3 - the draft RI mentions "Numerous logging and drill exploration roads cross the hillslopes surrounding the channel." We do not believe that any of these roads are appropriately described as "drill exploration roads". For over 25 years, any surface exploration would require a notice to be filed with the Idaho Department of Lands (IDL). These records are readily available.

Roads described in this segment are either logging roads or private property access roads. This is true for all Canyon Creek segments.

Response Text

Text modified as per comment.

2058 Draft | 3 | **1481**

Comment Text

Page 3-9 last paragraph - the Tamarack No. 7 waste rock is identified as a sediment source. As stated in comment #25 above, instream monitoring above and below the Tamarack No. 7 waste rock area during high flow does not show this area to be a sediment source.

Response Text

It may be that the reviewer's experience that historical mine waste rock areas are stable; however, these areas weather, erode, or may become unstable over time. As such, these areas constitute a sediment source to the system.

2059 Draft | 4 | **1482**

Comment Text

Page 4-1, second paragraph under Section 4.1 - mention is made of "...applicable risk-based screening criteria..." It should be

Response Text

Screening levels selected for use in the RI are described in Part 1, Section 5. The

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pointed out that most "screening levels" used in the draft RI are not "applicable" in a legal sense unless subjected to appropriate Administrative Procedures Act requirements. Further, the screening criteria should be explained and justified.				screening levels are not intended to be used as cleanup levels or remediation levels, but only to identify areas for further evaluation in the risk assessments and the feasibility studies. Cleanup levels will be determined in the ROD. See also the response to Comment #2146.
2060	Draft	4	1483	
Comment Text				**Response Text**
Page 4-1, last paragraph - "Major source areas" must be changed to "Potential source areas". No proof in the draft RI is given that each and every mining disturbance is indeed a source of metals and/or sediment.				These major sources have been determined to be sources of metals to the river and are evaluated further in the FS. Additional data will need to be gathered to support remedial design at these locations.
2061	Draft	4	1484	
Comment Text				**Response Text**
Page 4-2, Section 4.1.1 - Were there any groundwater samples taken in this segment? If so, what were the results? If not, why not?				Groundwater samples were not collected from this segment. This segment has been determined to not be a major source of metals to the creek and therefore, monitoring wells in this segment were not installed.
2062	Draft	4	1485	
Comment Text				**Response Text**
Page 4-6, Section 4.1.4.6, last paragraph - why does the draft RI jump to the conclusion that the mere presence of elevated metal levels in "surface soil" automatically equates to "significant sources of metal contamination in Canyon Creek"? This falsely assumes all metal forms are equally soluble. Also, why aren't "natural sources" considered as sources?				Surface water in Canyon Creek is not the only matrix of concern. Terrestrial wildlife and human receptors may be exposed to elevated concentrations in surface soil. Text modified to clarify that there are significant sources of metal contamination in the Canyon Creek watershed. Natural sources of metals listed in the comment contribute to the background concentrations of metals observed in soil, sediment, and surface water. By using the background concentrations in conjunction with risk-based screening levels, locations with background concentrations of metals or less are screened out from further evaluation in the RI/FS process.
2063	Draft	4	1486	
Comment Text				**Response Text**
Pages 4-6 & 4-7, Section 4.1.4.7 - what evidence is there that "tailing piles" are "significant features" at the Tamarack No. 7, Hercules No. 5, and Hecla-Star Complex/Tiger Poorman/Hidden Treasure areas? Tailings were historically discharged directly into the stream. Any remnant tailings in these areas would only be associated with floodplain materials.				Areas potentially containing tailings are shown in Figure 4.1-14 (Tamarack No. 7) and Figure 4.1-17 (Hecla-Star/Tiger Poorman/Hidden Treasure). Tailings may be mixed with the waste rock piles observed at the Hercules No. 5 site (Figure 4 1-15). These notes are based on site observations during sampling efforts conducted for the RI/FS.
2064	Draft	4	1487	
Comment Text				**Response Text**
Page 4-7, first paragraph - what is the basis for the statement "These source areas are known to have high concentrations of metals..."?				Data collected and compiled for the RI (see Tables and Figures in Section 4 1, and Data Summary Tables in Attachment 2).

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2065 Draft | 4 | 1488

Comment Text

Page 4-7, first paragraph - what type of strange classification system is used in the draft RI that would term Burke, Mace, and Gem as "major cities"?

If one of the "units of interest" would be "Jig-era railroad embankment fill", why wouldn't the public roads be included?

Response Text

Text modified to call these features towns.

2066 Draft | 4 | 1489

Comment Text

Page 4-8, Section 4.1 5.5 - exactly what is considered a "surface water" source in the draft RI? Would a seep in the floodplain be sampled and reported as "surface water" or "groundwater"? If seeps are considered "surface water", what logic is used to term seeps in this manner rather than classifying seeps as "groundwater" interacting with surface water?

Response Text

Water samples collected directly from rivers or creeks, adits, seeps, and outfall samples were classified as surface water samples.

The logic used to classify seeps and adits as surface water is that they are water samples collected from a surface location as opposed to water collected from under the ground. The location type of seep and adit are maintained in order to analyze these data independently from surface water collected from other locations.

2067 Draft | 4 | 1490

Comment Text

Page 4-9, Section 4.1.5.7 - the draft RI has not produced a shred of evidence that the "Hecla-Star Tailings Ponds" are a "major source" area. Loadings to both lower Ninemile Creek and the Coeur d'Alene River increase without the presence of tailings impoundments so what evidence is there that the tailings ponds load to the surface water system above what would be expected absent the tailings impoundments? The discharge from Pond #6 (the only active pond receiving inflow) is cleaner than the receiving water in this location.

Response Text

1) See response to Comment #1949.

2) The outfall data for total lead at Pond #6 (CC811) is comparable to total lead reported for the surface water sampling location CC285 (upstream from this outfall) and still exceeds screening level for total lead of 15 ug/L.

2068 Draft | 4 | 1491

Comment Text

Page 4-11, second full paragraph - the draft RI relates how a "probabilistic" model is used "to account for the potential measurement errors and natural variability in the stream system". The model also uses "input data. . . from historical measurements". Given the fact that approximately 600,000 cubic yards of material was removed from the floodplain in recent years and the "stream system" may not be stabilized, an accurate baseline cannot be established and model results cannot be representative of the current "stream system". A new baseline must be established after the system has stabilized from the removal actions before any meaningful modeling can occur. In addition, all future monitoring events must address loading variations, if any, on the ascending vs. the descending limbs of the hydrograph.

This shortcoming also invalidates "indicator metal correlations" and "linear regression analysis" results conducted in subsequent sections of the draft RI.

Response Text

Data collection began before the removals and continued after the removals. The data can be used to help establish pre-removal conditions and affects (if any) of removals.

Note that the most recent sampling conducted in this area (USGS water year 1999) clearly show surface water concentrations routinely exceed AWQC despite the removals. Monitoring of this area will need to be done in support of remedial design to evaluate the long term impacts on stream quality in this area.

2069 Draft | 4 | 1492

Comment Text

Page 4-14, item 2. of Section 4.2 2.1 - why isn't "floodplain material" identified as a potential source of total lead?

Response Text

Floodplain material added as a potential source of total lead in this reach.

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2070	Draft	4	1493	
Comment Text				**Response Text**
Page 4-15, item 1. of Section 4 2.2 2 - why isn't "floodplain material" identified as a source? Loading increases are observed on the downstream portions of both Ninemile Creek and the Coeur. d'Alene River where "floodplain material" is the only source (other than natural background & urban stormwater runoff components). "Floodplain material", along with natural & urban stormwater runoff, must be considered sources in all segments.				Floodplain material added as a potential source of total lead in this reach. Natural sources of metals listed in the comment contribute to the background concentrations of metals observed in soil, sediment, and surface water. By using the background concentrations in conjunction with risk-based screening levels, locations with background concentrations of metals or less are screened out from further evaluation in the RI/FS process.
2071	Draft	4	1494	
Comment Text				**Response Text**
Page 4-17, Section 4.2 2.3 - the groundwater mass loading is only evaluated for low flow conditions (September/October 1999). During high flow conditions when the shallow alluvium is saturated, given an elevation drop of Canyon Creek below Burke (location of mills) to the mouth of approximately 1300 feet, significant loading may be occurring as groundwater is flushed out of the floodplain material into the surface water. An evaluation of groundwater loading cannot be limited to low flow conditions.				Additional groundwater sampling may conducted if necessary to support remedial design.
2072	Draft	4	1495	
Comment Text				**Response Text**
Page 4-17, second paragraph of Section 4 2.2 3 - the draft RI states "The mass loading of metals in groundwater at the mouth of Canyon Creek is very small compared to the loading of metals in surface water." What exactly does this mean? Is EPA saying that groundwater/surface water interactions only occur at the mouth of Canyon Creek? During dry low flow conditions, surface point sources are generally lower in concentration than Canyon Creek at the mouth. Groundwater interactions with alluvium material must account for the bulk of the metal loads. The 1991 MFG low flow study identified virtually the entire reach from Burke to the mouth where "erosion/dissolution of tailings" occur as loads to Canyon Creek.				Monitoring wells CC480 and CC481 are located at the mouth of Canyon Creek, downgradient from the alluvial floodplain. Metals loading at these two wells has decreased considerably because the loading from the alluvial floodplain groundwater has already discharged to the surface water of the Creek. Text modified to clearly make this point.
2073	Draft	4	1496	
Comment Text				**Response Text**
Figure 4.1-14 - What is the basis for the "POTENTIAL TAILINGS AND CONCENTRATES PRESENT" label upgradient of the mill location? It is our understanding that the mill discharged tailings directly to the creek and concentrates were loaded at track level adjacent to the stream.				Based on field observations, residual tailings may be present in upland areas.
2074	Draft		1497	
Comment Text				**Response Text**
Figure 4.1-17 - What is the basis for the two labels "TAILINGS POTENTIALLY PRESENT"? As commented above, tailings were discharged directly to the creek. The location of Canyon Creek is drawn incorrectly, as is the No. 3 adit.				Based on field observations, residual tailings may be present in upland areas. Because the features in this figure have not be been surveyed, locations are shown relative to each other. As noted on the Figure, the location for Adit No.3 has not been verified.
2075	Draft	4	1498	
Comment Text				**Response Text**
Figure 4.1-22 - We are not familiar with the location "Star No. 3 adit". Groundwater from numerous areas of the mine workings,				Text on Figure referring to Star No 3 Adit removed.

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including the Star 2000 level and Omaha tunnel, discharge to the #6 pond.				
2076	Draft	4	1499	
Comment Text				**Response Text**
Figure 4.1-26 - This is not a "tailings pile", it is the mine waste rock area.				Figure title changed to address comment.
2077	Draft	4	14100	
Comment Text				**Response Text**
Figure 4.1-29 - The photograph/negative is reversed. (The proper view is from the backside of the page.)				Figure deleted.
2078	Draft	4	14101	
Comment Text				**Response Text**
Figures 4.1-33 & 4 1-34 - These are only views of the Star tailings ponds. These ponds have no association with the Tiger/Poorman or Hidden Treasure.				Figure title changed to address comment.
2079	Draft	4	14102	
Comment Text				**Response Text**
Figure 4.1-35 - This is not part of the Hecla Star Complex.				Figure title changed to address comment.
2080	Draft	4	14103	
Comment Text				**Response Text**
Table 4 1-3 - We do not believe that there are "upland tailings" at the Hercules No. 4 site.				These source types were identified during sampling and identified by the BLM during their development of the original source area list.
2081	Draft	4.1	14104	
Comment Text				**Response Text**
Table 4.1-4 - We do not believe that "upland tailings" and "buildings & structures" are "sources" at the "Hecla-Star Mine & Millsite Complex".				As indicated in Figure 4.1-17, tailings are potentially present in the mill area. Buildings and structures are included in the description of potential source materials in Table 4 1-4 because they are a potential human health exposure risk, not necessarily a direct source of metals to the Creek.
2082	Draft	4	14105	
Comment Text				**Response Text**
Table 4.1-4 - We do not believe that "upland tailings" are sources at either the "Tiger-Poorman Mine" or the "Tamarack No. 7 (1200 Level)". There are no tailings on the "uplands".				These source types were identified during sampling and identified by the BLM during their development of the original source area list.
2083	Draft		14106	
Comment Text				**Response Text**
Table 4.1-5 - What is the evidence suggesting that the "Hecla-Star Tailings Ponds" are sources of "floodplain tailing"(within the impoundment?), "groundwater", or "seep"?				See response to Comment #1949.
2084	Draft	4	14107	
Comment Text				**Response Text**
Table 4.2-2 - sample dates indicate that samples either pre-date removal actions or may have occurred during a post removal stabilization period, thus making these events unsuitable for a realistic mass loading analysis.				Available data were analyzed and presented. Results from 1991 and 1998 are very similar, indicating that removal efforts may not have had an impact on the Creek. Additional monitoring may need to be conducted to support remedial design.

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2085 Draft | 5 | **14108**

Comment Text

Page 5-1, second paragraph under Section 5. 1 - If the total recoverable values for lead and cadmium were used rather than the dissolved values for comparison with the water quality criteria, both lead and cadmium would exceed the chronic value unless the hardness was well above 100 mg/1.

Response Text

Reviewer is confusing non detect ("U") with measured values. Based on the "Data Summary Table" in Attachment 2, no "detected" total lead concentrations exceeded the criterion of 15 ug/L for total lead. One analytical detection limit was above the criterion but no detected measurement exceeded the total lead criterion.

The highest measured total cadmium concentration was 4 ug/L. The criterion for total cadmium in surface water is 5 ug/L. The reviewer's comment with regard to cadmium is also incorrect.

Additionally, the AWQC are based on the dissolved fraction. Using the total recoverable concentrations for direct comparison is inappropriate.

2086 Draft | 5 | **14109**

Comment Text

Page 5-1, last paragraph - Gorge Gulch is dry in several areas during the summer months and physical barriers prevent any fish migration. A cold water biota designation, thus ambient water quality criteria, is not appropriate for Gorge Gulch.

Response Text

For consistency with the other discussions, the criteria were compared to metal concentrations in Gorge Gulch.

2087 Draft | 5 | **14110**

Comment Text

Page 5-2, first partial paragraph - the draft RI indicates "The highest mass load for the five sampling episodes discussed was 2 pounds per day of dissolved zinc." Dissolved zinc at the mouth of Canyon Creek is up to 880 pounds per day (pg. 4-16 of the draft RI). The 2 pounds per day from Gorge Gulch is only approximately 0 23% at this 880 pounds per day level and does not constitute a problem.

Response Text

Last sentence in Section 5.1, paragraph 4 removed. Second to last sentence revised to: As discussed in Section 4.2, the metal loading (in Gorge Gulch) is low compared to downstream segments; however, dissolved zinc loading was calculated as high as 21.5 pounds/day during the spring 1998 high flow event. It is acknowledged in this section that Gorge Gulch is a minor loader compared to other Creek segments.

2088 Draft | 5 | **14111**

Comment Text

Page 5-2, second full paragraph - once again, the term "tailings piles" is not correct for the Star tailings impoundments.

Response Text

Text modified as per comment.

2089 Draft | 5 | **14112**

Comment Text

Page 5-2, third full paragraph - the statement is made "It is thought that groundwater interacts with floodplain sediments below the Hecla-Star tailing ponds and is augmented by drainage water discharged to the ponds." (emphasis added) As commented on above, there is only one pond receiving inflow, Pond #6, which is the furthest downgradient of the six ponds.

Response Text

Text modified to indicate that groundwater is augmented by drainage water discharged to pond No. 6 and precipitation.

2090 Draft | 5 | **14113**

Comment Text

Page 5-3, second full paragraph - the statement is made that "The primary sources of metals observed in surface water, groundwater, and sediment are ores, tailings piles, and waste piles located within the watershed." This simply is an illogical statement. First, we are not aware of any accumulation of "ores" in the watershed. Indeed, the source maps in the draft RI do not identify any "ores" as sources. Further, where exactly are any "tailings piles"? Is EPA including in the definition of" tailings piles" the tailings historically discharged directly to the stream (residuals of which are now mixed with the shallow alluvium) prior to the use of tailings

Response Text

Text in this section modified to indicate that the primary source of metals to surface water, groundwater, and sediment are waste piles and mixed tailings and alluvium.

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impoundments? Since there are no "ores" contributing and no "tailings piles" are identified, this leaves "waste piles" which we assume means mine waste rock. If mine waste rock is a "primary source", how does EPA explain the elevated stream metals concentrations during dry periods when no transport mechanism (i. e. precipitation) exists to carry metals from the "waste piles" to the stream? It is quite obvious from the facts that the real "primary source" is historic tailings mixed in alluvium material in the floodplain. This is the only source, in addition to a natural background component, of continuous dissolution of metals into the stream and groundwater.

2091 Draft | 5 | **14114**

Comment Text

Page 5-5, first paragraph - the draft RI states "…surface waters in Canyon Creek vary from slightly acidic (pH range of 3.4 to 6.2) to slightly alkaline..." What is considered by EPA to be "surface water"? Was the sample exhibiting a pH of 3.4 actually taken from the flowing body of Canyon Creek or from a "seep"? If so, the "seep" is more accurately characterized as a groundwater source entering the surface water system.

Response Text

Lower pH sample were collected at a seep. Text modified to indicate that lower pH waters were collected at seeps and adits. Text does not say that a sample of pH 3.4 was collected. Only that certain samples fell in the "range" of pH 3.4 to 6.2.

2092 Draft | 5 | **14115**

Comment Text

Page 5-6, first full paragraph - the draft RI discusses a "surface complexation model" and how this "is especially important in locations like Canyon Creek where there is potential for significant pH changes..." This statement is confusing given the statement made in the draft RI on page 5-5 (second paragraph), which we believe is the accurate assessment of pH in Canyon Creek that "In Canyon Creek, there is typically little change in the pH value. . . " It would appear that this model is of no value for Canyon Creek. This is substantiated by the faulty model predictions for cadmium and zinc discussed in the next paragraph on this page. The model appears to overestimate the dissolved form of the metal for cadmium and zinc, thus falsely predicting a more toxic form of the metal than actually exists in the system.

Further, although the predicted model values are close for "adsorbed" lead, what basis is there to claim that this lead was dissolved and subsequently "adsorbed" during high flow? Since the natural form of lead is lead sulfide, which is very insoluble, it seems more likely that the total lead was merely in the native mineral state and moved in this natural particulate form due to high flow conditions. What proof is there that this lead is indeed "adsorbed" and not in the natural mineral state?

Response Text

As mentioned in the preceding comments, pH values in the Canyon Creek watershed are in the lower pH range of 3.4 to 6.2 and in the alkaline range of 7.2 to 8.9. A Kd approach would not be appropriate as metal adsorption onto oxyhydroxides can go from 0 percent adsorption to 100% adsorption over 2 pH units. The approach used in the RI appears to give the most accurate predictions.

It is not claimed that lead was dissolved and then adsorbed in a flow event. The assumption is that an equilibrium exists between dissolved and adsorbed phases and for equilibrium conditions the sequence of reagent additions is not important.

There are high coefficients of determination (r2) between particulate iron and total lead concentrations indicating an association. Further, considerations of geochemistry (surface water, oxygen, oxidation of sulfides, densities) indicate that one would not expect to find lead sulfides carried along with the surface waters. Additionally, studies such as those of Horowitz and Reece indicate near surface submerged sediments deposited in the CdA Lake and the Lateral Lakes contain metals adsorbed onto metal oxide phases.

2093 Draft | 5.4 | **14116**

Comment Text

Page 5-7, Section 5.4 - discussions begin on the "probabilistic model" for metal fate and transport. As discussed in previous comments, the large amount of remediation activities in the watershed, coupled with inadequate time for the system to stabilize prior to performing baseline monitoring, does not allow the development or use of a model based upon historic sampling. Further, failure to account for differing metals and sediment loads associated with ascending and descending limbs of the hydrograph further compromises model results which must be compared with real world monitoring data to validate the model.

Response Text

Data collection over time provides an opportunity to evaluate the effects of remediation and current conditions. Additional monitoring in this area may need to be completed to support remedial design.

Metal concentrations on the ascending and descending limbs of the hydrograph are considered in and subsumed by the probabilistic model.

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2094 Draft — 5 — **14117**

Comment Text

Page 5-8, last paragraph - the draft RI states "Metal transport begins with the metal sources in the basin that have been created by historical mining activities." Metal transport is also comprised of a natural component and stormwater runoff from urban and rural areas which, according to EPA's own historic stormwater monitoring data base, can contain levels of lead, zinc, and cadmium well above water quality criteria. While the draft RI gives some indication of recognizing a natural background component for current metal levels, attached are the following items indicating natural background levels may be well above those predicted in the draft RI: well log data from both Ninemile and Canyon Creeks showing natural alluvium materials with elevated metal levels; spring sample results measured by DEQ in the headwater areas of the South Fork, examples of pre-mining levels of metals in the Red Dog mine area showing both water quality and sediment levels of metals extremely elevated prior to any mining activities.

Response Text

The non-mining related sources of metals listed in the comment contribute to the background concentrations of metals observed in surface water. By using the background concentrations in conjunction with risk-based screening levels, locations with background concentrations of metals or less are screened out from further evaluation in the RI/FS process.

2095 Draft — 5.4.1.1 — **14118**

Comment Text

Page 5-9, Section 5.4.1 1 - "Natural Variability" is discussed but the discussion fails to address the fact that tens of millions of dollars have been spent on remediation activities in the South Fork watershed. Until such remediation activities cease and the system is able to stabilize, a "natural variability" cannot be predicted by models or verified by actual monitoring results.

Response Text

Natural and man-induced (e.g., remediation activities) variabilities are incorporated into the uncertainties of the model predictions. These uncertainties are expressed in the coefficients of variation listed in the summary table of the modeling results (Table 5.5-1)

2096 Draft — 5 — **14119**

Comment Text

Section 5.0 in general discusses the use of models based upon historic monitoring. Our comments from above on the faulty use of historic monitoring and models apply throughout this section. In addition, alleged sources of the modeled estimates of metals contain the same faults as expressed in above comments which will not be repeated again in comments on Section 5.

Response Text

See response to Comments #2091 to #2095.

2097 Draft — 5 — **14120**

Comment Text

Page 5-27, last paragraph - the draft RI states, in discussions concerning Segment 5 where "groundwater reenters the creek as the canyon narrows", that "This groundwater likely originated from surface discharge to groundwater in upstream locations where the dissolved lead concentrations were lower." This scenario is only "likely" if somehow this surface water, after entering the groundwater upstream, is able to magically separate itself from groundwaters in subsequent downgradient segments where dissolved lead in groundwater is as high as 13,836 ?g/L. How can this be?

Response Text

Text corrected to reflect updated model results.

2098 Draft — 5.6.1 — **14121**

Comment Text

Page 5-33, Section 5.6 1, last paragraph - the draft RI only addresses human activities that may increase sediment transport. Fire suppression and thinning (to reduce the fuel load & risk of catastrophic fire) are human activities that actually reduce what otherwise would be "natural" sediment transport. Both sides of the equation must be discussed.

Response Text

The reviewers comment is appreciated. Fire suppression and thinning may reduce the damage due to forest fires and associated devegetation.

2099 Draft — 5.6 — **14122**

Comment Text

Page 5-33, Section 5-6 - this section discusses "Sediment Fate and Transport". Comments 25-33 above address concerns with draft RI methodology on sediment. These comments will not be repeated here although they apply.

Response Text

See response to Comments # 2050 to #2057.

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2100 Draft — 5.7 — **14123**

Comment Text

Page 5-37, first paragraph under Section 5.7 - the draft RI states "The probabilistic model was used to quantify and summarize the available data to estimate pre-remediation metals concentrations in surface water and mass loadings to Canyon Creek." Given the numerous faults in methodology described in the comments above, we believe the draft RI both overestimates loads and attributes the loading to the wrong sources. Besides, how can an estimate of "pre-remediation" occur when 600,000 cubic yards of materials have already been removed from the floodplain?

Response Text

The term pre-remediation removed from Page 5-37, first paragraph.

Previous responses to comments have addressed various misconceptions and misunderstandings of reviewers regarding the probabilistic model. Part of the problem lies in the fact that the Probabilistic Technical Memorandum had not been completed when the Draft RI/FS went out. It is currently available for review.

Contrary to the reviewer's comments, the probabilistic model in the RI does not assign loadings to particular sources. The model in the RI estimates expected loads at various sampling locations and looks at expected increases or decreases in loads between these sampling locations or "reaches." As part of the discussion of reaches, the RI mentions potential sources in these reaches. No load is assigned to any of these potential sources.

Many of the data were collected prior to implementation of remediation activities. Other data were collected in the same time frame as the remediation activities and post remediation. Additional monitoring may be completed to support additional remediation work.

2101 Draft — 5 — **14124**

Comment Text

Where in Section 5 is a direct comparison of modeled results vs. monitored results for either sediment or metals at the same instream flow? Since it does not appear to exist in a single graph, why not? This relationship must be developed, showing modeled results vs. actual instream monitoring used in the development of the model. Otherwise, there is no verification that the model, even remotely, is applicable.

Response Text

The relationships mentioned by the reviewer have already been developed and presented in the RI. Further, contrary to the reviewer's comment, they are presented in a single graph. For example, Figure 5.5-15 presents actual cadmium concentrations at various discharges (represented by the diamonds). The estimated values are represented by the dotted line.

2102 Draft — 5 — **14125**

Comment Text

Page 5-78, Table 5.1-1 - the flow (cfs) values for these sampling events must be included in the table in order to provide a basis of comparison with "estimated expected" model results.

Response Text

Table deleted. Text revised to refer the reader to the summary table of measured flows, concentrations and calculated discharges in Section 4.2 (Table 4.2-2).

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2120 Draft — 1 — 14143

Comment Text

Page 1-1, first paragraph - the draft states "The watershed has been heavily affected by mining activities, and past and continuing releases of mining wastes." Virtually all of the "releases" are due to "past" activities. The RI is not the place to be trying to state legal positions, but rather should be the collection and analysis of data.

Response Text

Releases are still occurring as evidenced by the extremely high concentrations of dissolved zinc in surface water.

EPA agrees that the RI (as well as comments on the RI) should not be the place to be trying to state legal positions.

2121 Draft — 1 — 14144

Comment Text

Page 1-1, second paragraph - the draft discusses ". . . a non-time critical removal of 66,000 cubic yards of waste rock and tailings. . . ". Waste rock was not a target of the removal action. Waste rock was utilized as construction material for the repository but the removal action was specifically directed at removal of the tailings.

Response Text

Text revised to remove reference to removal of waste rock.

2122 Draft — 1 — 14145

Comment Text

Page 1-1, third paragraph - it should be noted that prior to EPA's relocation of the stream channel at the Success Mine/Mill site, the streambed always contained flowing water; now, the streambed is routinely dry during low flow months, which may adversely impact the health of aquatic organisms.

Response Text

Comment noted.

2123 Draft — 1 — 14146

Comment Text

Page 1-1, last paragraph - once again the draft RI insinuates that waste rock was a target of past removal actions. This is not correct. Tailings in the floodplain were the only reason for the removal actions, although some waste rock may have been incidentally moved as well.

Response Text

Text revised to remove reference to removal of waste rock.

2124 Draft — 2 — 14147

Comment Text

Page 2-2, first paragraph - there is no discussion concerning the metal content of alluvial materials. The 1994 SVNET removal action, mentioned on page 1-1 of this report, resulted in the document "Removal Work Plan for 1994 Ninemile Drainage Projects" (MFG, May 10, 1994). This document contains analysis results of the natural alluvium containing high concentrations of both zinc and lead as would be expected in a highly mineralized area. This document is certainly readily available in both DEQ and EPA files on the basin, but is conspicuously absent from the draft RI. The draft RI appears to be ignoring the concept of high mineralization in streambed materials as a source of metals to both the groundwater and surface waters of the Ninemile drainage. Lack of discussion about natural mineralization in the streambed as a potential source of metals makes the RI more of a political rather than a scientific document.

Response Text

Non-mining related sources of metals contribute to the background concentrations of metals observed in soil, sediment, and surface water. By using the background concentrations in conjunction with risk-based screening levels, locations with background concentrations of metals or less are screened out from further evaluation in the RI/FS process.

2125 Draft — 2 — 14148

Comment Text

Page 2-2, first paragraph under Section 2.1.3 - while the fact that numerous faults exist in the drainage is admitted, a discussion of how faults also provide a pathway for groundwater to flow through mineralized areas (thus picking up metals in the groundwater) is not listed as a "potential source" of metals. This source should be acknowledged and discussed.

Response Text

Non-mining related sources of metals contribute to the background concentrations of metals observed in soil, sediment, and surface water. By using the background concentrations in conjunction with risk-based screening levels, locations with background concentrations of metals or less are screened out from further evaluation in the RI/FS process.

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2126 Draft | 2 | **14149**

Comment Text

Page 2-5, all sections - the general discussions surrounding any seeps, springs, adits or other discharges conclude that all such sources end up in the creek. What is the basis for this blanket statement? Were tests conducted on all such sources to verify a direct link to surface waters? If this is merely a presumption with no factual basis, then this limitation should be admitted in the text. The fact is that water flow from many adits is utilized by the vegetation which has become established at the adits, or the water infiltrates into native soils.

Response Text

Text added to page 2-6, Section 2.1.7.2, to clarify that some of these drain to tailings piles and not directly to the creek.

2127 Draft | 2 | **14150**

Comment Text

Page 2-7, first full paragraph - the draft states "Erosion of upstream tailings sources has resulted in transport and redeposition of tailings. . . " The only erosion of tailings would be the tailings historically deposited directly to the stream. The Interstate, Success, and Dayrock tailings sites have all been secured against sediment erosion to the system. This should be clarified.

Response Text

Text modified on Page 2-7: "Past erosion of upsteam tailings sources"

2128 Draft | 2 | **14151**

Comment Text

Page 2-8, second paragraph under 2.2.3 1 and first and second paragraphs under 2 2.3.2 - exactly how did the referenced "study" or "evidence" show that adit drainage actually discharged to the creek? Was it dye tests or other form of tracer study? It appears that the study conclusions, cited here as fact, may have been speculative.

Response Text

Comment noted; however, the text states that the adit discharges to a waste rock pile which is adjacent to the river. Because the waste rock pile is most likely unlined, the discharge ultimately will discharge to the river.

2129 Draft | 2 | **14152**

Comment Text

Page 2-8, last paragraph - a discussion of seepage in 1996 from the Interstate tailings is made. What is the point of this since the tailings were relocated in 1998 as stated on page 1-1 of the draft RI? Further, in this same paragraph, what studies prove that it "is known" that both Tamarack adit and Rex tailings "mine drainage"(?) enter the stream? Note that the vegetation in these areas has become well developed to utilize the moist conditions.

Response Text

Text modified to acknowledge observed decreases in concentrations.

2130 Draft | 2 | **14153**

Comment Text

Page 2-9, Section 2 2.3 3 - what is the basis for the statement ". . there is little interaction between the groundwater and surface water. . ."? It appears that there were no monitoring wells located in Segment 03. In addition, since recent mapping ". . . indicate no accumulations of tailings or other mine wastes", thus groundwater monitoring would be desired to determine "background". Would the exceedances of water quality standards in this segment be due to natural sources?

Response Text

1) Because detailed studies on surface water/groundwater interactions have not been conducted in this area, information presented in this section is based on observations of physical features of the stream and general conclusions are drawn.

2) Non-mining related sources of metals contribute to the background concentrations of metals observed in soil, sediment, and surface water. By using the background concentrations in conjunction with risk-based screening levels, locations with background concentrations of metals or less are screened out from further evaluation in the RI/FS process.

2131 Draft | 2.3 | **14154**

Comment Text

Page 2-12, first full paragraph - there is a discussion concerning the development of a synthetic hydrograph for the Ninemile drainage based upon comparison of East Fork Ninemile flow data and flow data at the mouth of Ninemile Creek at Wallace. The narrative indicates ". . . there may be some uncertainty in the predicted discharge for higher flows. The discharge values from this

Response Text

Text revised on page 2-12 to remove the inaccurate statement that these synthetic hydrographs were used in mass loading calculations in other sections of this report. Sediment transport data presented in Section 3.0 are from suspended and bedload

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synthetic hydrograph are used in mass loading calculations..." Since these discharge values are key in calculating mass loading, please quantify the "uncertainty". Also, please explain the exact dates of the flow measurements used for correlation, which were taken ". . . at approximately the same time..." Were flow measurements all taken on ascending or descending limbs of the hydrograph or were measurements taken during steady-state low flow conditions?

sediment measurements conducted and reported by the USGS. Mass loading values presented in section 4.2 are based on actual measured concentrations and flow rates. Mass loading estimated expected values presented in Section 5.0 are also based on these actual data and not from the synthetic hydrographs.

2132 Draft | 2.3.2.1 | **14155**

Comment Text

Pages 2-12 & 13, Section 2.3.2.1 - a mean daily discharge was estimated for Ninemile Creek based upon historical Placer Creek flow data by use of a drainage area ratio. This resulted in overestimates of "…the peak daily mean discharge by 133 percent." A subsequent "multiple of Placer Creek discharge" was used that resulted in an overestimate of "…approximately 45 percent…" While this is an improvement over a 133 percent overestimate, this still grossly overestimates all calculated loads (metals and sediment). Two questions arise: 1) how does a peak mean daily discharge distort actual loads on the high side, and 2) given the history of both annual flow data at Placer Creek and historical annual precipitation records, would a ratio of precipitation to discharge on Placer Creek be more useful to estimate discharge in Ninemile Creek using the 1999 discharge data (especially if a mean annual discharge is to be used)?

Response Text

See response to Comment #2131.

2133 Draft | 2 | **14156**

Comment Text

Page 2-27, Dayrock mine - sand backfill began in 1949 and the tailings impoundment was utilized in 1968.

Response Text

Text updated with information from expert testimony from Rex Bull 1999.

2134 Draft | 2 | **14157**

Comment Text

Page 2-35, Table 2.2-3, Well Water Chemistry - this table indicates that groundwater chemistry sampling (and groundwater depth) only occurred in December 1998. This shortcoming is not addressed in the narrative in Section 2.2.4. While a December sampling could represent low flow conditions in the watershed, lack of sampling during high flow periods ignores the saturation of the shallow alluvium aquifer when potential surface/groundwater interactions would most likely occur. This data gap must be filled. In addition, why don't the tables also indicate the metal levels of the groundwater?

Response Text

1) The monitoring wells in Ninemile Creek were sampled twice (December 1998 and December 1999), both during low flow conditions. Results were similar for the parameters included in this table, therefore, only data for one event was included in this discussion. Data for high flow conditions are not available. If needed to support design, additional groundwater data will be collected.

2) Groundwater metals data are presented in Section 4.

2135 Draft | 2 | **14158**

Comment Text

Page 2-36, Table 2 3.1-1, Summary of Discharge Data From Project Database - the column headings "Maximum Discharge" and "Minimum Discharge" are switched.

Response Text

Text corrected.

2136 Draft | 3 | **14159**

Comment Text

Page 3-1, second paragraph - a one-sided view of how "human activities...can significantly increase" sediment transport is given. The fact that human activities such as fire suppression and thinning (to reduce fuel load) also act to reduce the rate of "natural" sediment transport must also be mentioned.

Response Text

The reviewer's comment is appreciated. Fire suppression and thinning may reduce the damage due to forest fires and associated devegetation.

2137 Draft | 3 | **14160**

Comment Text

Page 3-2, first full paragraph - the statement is made that "To date, data from seven suspended load and six bedload sampling events

Response Text

The dates of the sampling events are given in "Transport of Suspended and Bedload

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were available from three storm events." What were the dates of these events and the actual measured flows and sample results? (Figure 3 2-1 does not have, but should have, an associated table with the actual monitoring results) According to Figure 3.2-1, it appears that the lowest measured flow during a sampling event was approximately 3 5 cfs. From the measured Ninemile Creek flows on Figure 2 3.2-1, it appears that the majority of days in the year this flow is not exceeded. If the peak mean daily flow is used, rather than actual daily flows, the extent to which this distorts actual sediment transport should be explained.

Sediment at Eight Stations in the Coeur d'Alene River Basin, Idaho" by Clark and Woods. Available at the USGS web site, http://idaho.usgs.gov. The lowest measured discharge during a sampling event was 18 cfs. The reviewer makes a good point that most days the discharge is less than 18 cfs. Very little sediment transport occurs at these small discharges. Most sediment movement occurs during storm or snowmelt events. If peak mean daily discharge were used the estimated sediment transport would go up significantly. It would be inappropriate to use such a value because most of the time stream discharges are less than the peak annual daily discharge.

2138 Draft 3 **14161**

Comment Text

Page 3-2, first full paragraph - at what flow are either bedload or suspended loads "unmeasureable" based on the sampling procedure?

Response Text

Channel geometry and discharge both impact the lower boundary of sediment collection. In this case the lower boundary is less that 18 cfs.

2139 Draft 3 **14162**

Comment Text

Page 3-2, first full paragraph - it is stated that ". . . sampling was completed on both the rising and falling limbs of high water events to examine the transport during these differing conditions." What were the results? How, for example, does the load of both metals and sediment compare for a 50 cfs flow on the rising limb vs. a 50 cfs flow on the falling limb of the hydrograph? Shouldn't all past monitoring data events be separated according to rising/falling/steady-state flow conditions so as not to distort the results?

Response Text

This analysis averaged the results to provide an overall estimate for both the rising and falling limbs.

2140 Draft 3 **14163**

Comment Text

Page 3-7, Section 3 2.3 1, last sentence - "rocky debris" (waste rock?) is listed as a likely source of sediment. It has been our experience that historic waste rock areas are extremely stable and not a source of significant sediment. The 1991 MFG high flow sampling showed TSS readings of less than 1 mg/l in the East Fork of Ninemile Creek below the Interstate mine waste rock areas.

Response Text

It may be that the reviewer's experience that historical mine waste rock areas are stable; however, these areas weather, erode, or may become unstable over time. As such, these areas constitute a sediment source to the system.

2141 Draft 3 **14164**

Comment Text

Page 3-8, third full paragraph - the statement is made that "Logging and exploration drill roads dissect the hillslope. . ." Throughout the draft RI, "exploration drill roads" are mentioned as a sediment source. Virtually all roads in the drainage are private property access roads, public roads, or logging roads. Surface exploration for mining purposes is relatively rare in the Silver Valley. Information on surface exploration drill roads is readily available, yet not utilized in the draft RI, from the Idaho Department of Lands (IDL). The Idaho Surface Mining Act has been in existence for almost 30 years. Regulations promulgated under the Act's authority require notice to the IDL. The actual extent of exploration drill roads in the Silver Valley may be determined by review of the IDL records. Further, any pre-Act exploration drill roads used solely for exploration drilling would have long since been naturally revegetated and would not be a likely source of sediment. Exploration drill roads constructed under authority of the Act require reclamation. While the bent of the draft RI is obviously to demonize any mining related activity, exploration drill roads are not a reasonable source of sediment.

Response Text

Text has been modified

2142 Draft 3 **14165**

Comment Text

Page 3-8, third full paragraph, last sentence - there is not an "operating mine" in the Ninemile Creek drainage to our knowledge. Further, the draft RI in Table 2.1-1 does not identify an operating mine.

Response Text

Text has been modified.

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2143 Draft | 3 | 14166

Comment Text

Page 3-9, first partial paragraph, last sentence - the draft RI indicates ". . . sediment from the operating mines". It appears the reality of no operating mines has progressed to one and then more than one "operating mines".

Response Text

Text has been modified.

2144 Draft | 3 | 14167

Comment Text

Page 3-10, first partial paragraph - the statement is made that "The Day Mine Tailings Dam...is located on a steep hillslope in a shallow ravine." First, this is the "Dayrock" tailings dam. Second, it is not located "in a shallow ravine". Third, a diversion ditch is located on the hillside upgradient of the tailings dam to divert runoff away from the tailings dam. It is difficult to imagine how this particular site could be so mischaracterized.

Response Text

The site that was referred to was actually the Mayflower Mine. Text has been modified.

2145 Draft | 3 | 14168

Comment Text

Page 3-37, Table 3.2-1, "Historical Estimates of Sediment Transport" should be revised to reflect comments 18-20 above.

Response Text

Comment noted, description of estimates is provided in the text.

2146 Draft | 4 | 14169

Comment Text

Page 4-1, second paragraph under 4 1, first sentence - mention is made of "applicable risk-based screening criteria". No criteria are "applicable" unless subjected to valid APA requirements at both the state and/or federal levels. For example, "U.S. EPA Region IX PRGs" and NOAA sediment screening values have no legal effect.

Response Text

It is clearly stated that these values are used for screening purposes only to identify areas for further evaluation in the FS. Cleanup goals will be established in the ROD.

2147 Draft | 4 | 14170

Comment Text

A general comment on Section 4.0, "Nature and Extent of Contamination", would be the exclusion of natural sources as contributors to both metals and sediment loads. This reality must be addressed.

Response Text

Non-mining related sources of metals contribute to the background concentrations of metals observed in soil, sediment, and surface water. By using the background concentrations in conjunction with risk-based screening levels, locations with background concentrations of metals or less are screened out from further evaluation in the RI/FS process.

2148 Draft | 4 | 14171

Comment Text

Page 4-7, Section 4 1.4.7 - the statement is made that "The major source area identified in segment NMSego4 is the Dayrock Mine/Mill and Tailings Repository." The statement is made, without reference, that "This source area is known to have high concentrations of metals from historic mining activities." The reference should be given. Based upon a review of the Data Summary Table for this segment, the last time surface water samples were taken both above this Dayrock "source" (NM443) and below (NM301) was on Dec. 6, 1998. Stream metal concentrations were actually lower downstream of this "major source" and there are no tributaries between these sample locations. The mere existence of historical mining activities at a site does not equate to a "major source" in all situations.

Response Text

Statement removed.

2149 Draft | 4 | 14172

Comment Text

Page 4-8, Section 4 2 - Surface Water Mass Loadings - several comments must be made: 1) there is a difference in a "real source" vs. "potential source" and the draft RI treats all "sources" the same; this makes it difficult to understand how the draft RI will be of

Response Text

1) See response to Comment # 2150.
2) Mass loading observations in section 4 are analyzed separately for low flow events

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any value to the FS development if imaginary problems are included in a "solution"; 2) the use of sample results which pre-date remediation efforts are of no value; further, any samples taken during remediation efforts or a post-remediation stabilization period must be identified. For example, it is logical to conclude that stabilization efforts at the Interstate Mill site and the one million dollar effort at the Success site coupled with the removal of 150,000 cubic yards of floodplain materials would result in a reduction in metal loads - these remediation activities must be allowed to stabilize with subsequent monitoring of the system to identify true sources. And 3) the draft RI places too much emphasis on hypothetical models to "estimate" loads with virtually no clear-cut comparison of hypothetical vs. real world monitored results - a graph of estimated loads (metals and sediments) from the models that also graphs actual monitoring results for the same flow conditions must be prepared. Indeed, there appears to be a concerted effort to hide true loads of sample events as evidenced by the lack of associated flow monitoring results for chemical sampling events.

and high flow events. The most recent set of data available was for May 1998 (high flow) and December 1998 (low flow) did not differ significantly from the high and low flow events reported in 1991. Concentrations of dissolved zinc in Ninemile Creek still routinely exceed AWQC by up two orders of magnitude.
3) The section to which this comment pertains does not contain any modeling results, only as-measured results. The probabilistic modeling results presented in Section 5 are based on these same data sets. The figures in Section five showing the modeling results also show the actual data (see Figure 5.2-9).

2150 Draft 4 **14173**

Comment Text

Page 4-9, third paragraph under "Loading observations" in Section 4.2.2.1 - the draft RI actually lists past remediation (Rehab) efforts as "source areas"! What is EPA's intent here? While it is recognized that the removal of 150,000 cubic yards of floodplain materials will obviously result in short term increases of loads, it is illogical to equate actual sources with no remediation to date with areas where "rehab" has taken place. It is apparent that virtually all loading to the streams is due to floodplain tailings and natural metal sources.

Response Text

This section documents observed increases in loading in specific reaches during specific sampling events and potentially associated sources of this increase. Major source areas in this segment are listed in Section 4.1 2.7 and did not include these three sources.

2151 Draft 4 **14174**

Comment Text

Page 4-10, third & fifth full paragraph under "Loading Observations" - it is indicated that the highest zinc loading measured at NMSeg02 was 616 pounds/day, but the downstream segment "NMSeg05" (there are only 4 segments, thus we assume the draft RI means NMSeg04) lists the highest zinc load at 541 pounds/day. Then, the statement is made that "The Dayrock Mine and Dayrock Mine Tailings Piles/SVNRT Repository are located in the upper portion of the segment." We fail to see the point of these statements. The zinc load is 75 pounds/day less below the Dayrock site; is the site being credited for zinc removal? In addition, there are no "tailings piles" at the Dayrock site; the tailings are in an impoundment. Mixed tailings in the alluvium at the Dayrock site are from upstream sources.

Response Text

Typo corrected.

The following text has been deleted. "The reach immediately below the confluence of the East Fork and mainstem consistently lost zinc load. This may be the result of dilution of the highly impacted East Fork water mixing with the little-impacted mainstem water." Available data suggest that loading decreases in this reach. It is unclear why.

See response to Comment #2155.

2152 Draft 4 **14175**

Comment Text

Page 4-11, Groundwater Mass Loading - the statement is made that "The mass loading of metals in groundwater at the mouth of Ninemile Creek is expected to be small compared to the loading of metals in surface water." This may only be true if this statement is indeed limited to "the mouth". From the limited information contained in the draft RI, we do know the following: 1) there is an elevation drop at stream level of at least 1500 feet where tailings were historically discharged to the stream, 2) the system consists of shallow alluvium underlain by impermeable bedrock, 3) hydraulic conductivity is at least 100 feet/day, 4) loading increases even during dry periods (no surface runoff sources), 5) well sampling is reported only for low flow conditions, and 6) reported dissolved metals concentrations in well water are extremely elevated (zinc up to at least 123,000 ug/1, lead up to 3,560 ug/1, and cadmium up to at least 942 ug/1). Flow increases in the main stream channels (East Fork Ninemile & Ninemile) cannot be accounted for solely by surface tributaries. Indeed, Section 5.2.1 identifies half the "reaches" in the watershed as "gaining reaches". Groundwater appears to be moving into the surface water throughout the watershed. This groundwater carries metals from both natural sources

Response Text

Surface water/groundwater interactions are discussed in Section 2 2.3. A detailed study of losing and gaining reaches within the watershed has not been completed.

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and past discharges of tailings to the floodplain. It is noted that that the narrow canyon and shallow groundwater depth forces groundwater to discharge to surface water. This is particularly enlightening when reading the loading results of Section 4.2.2.2 and Figures 4.2.7-12.

2153 Draft | 4 | **14176**

Comment Text

Figures 4.1-2 through 4.1-6 all contain a label "CANYON CREEK IMPACTED FLOODPLAIN" on the E. Fork of Ninemile Creek.

Response Text

Labels corrected.

2154 Draft | 4 | **14177**

Comment Text

Figure 4.1-11, there never was a mill at the Tamarack as shown on this drawing. Also, we are not aware that any "adit drainage" is "piped" to the Tamarack No. 7 on Canyon Creek (the Tamarack #7 is at least 750 feet lower in elevation than the adits on the EF Ninemile).

Response Text

Text and Figures revised to remove reference to upland tailings and adit drainage; however, historical hand sorting operations generated three large waste rock piles that may contain high concentrations of metals.

2155 Draft | 4 | **14178**

Comment Text

Figure 4.1-22, the two sites labeled "older tailings pond" were only used for emergency mill overflow conditions (e.g., water line break). Also, the label "TLGS PILE" is not correct - this is a tailings impoundment. We are also puzzled by the label "potential tailings present" in the adit area, and the basis for the label. This material is simply waste rock.

Response Text

The source area name Dayrock Mine TLGS Pile/SVNRT Repository is that provided by the BLM in the base GIS coverage used throughout the RI. In order to maintain consistency throughout the documents, the names have not been changed. Refinements to the names or associated source types are clarified in the text.

2156 Draft | 4 | **14179**

Comment Text

Tables 4 1-1 to 4.1-4 should clarify that the "Source Description" column is a "Potential Source Description". No evidence has been presented that verifies waste rock or other mining areas outside the floodplain are legitimate sources of the metals or sediments to Ninemile Creek.

Response Text

Titles for this series of tables updated to "Potential Source Areas"

2157 Draft | 4 | **14180**

Comment Text

Table 4.1-2, as previously mentioned there was not a mill site for the Tamarack at BUR 170, 171, 056 areas, thus no "upland tailings". This would include any references to "potential intermixed tailings" at the Tamarack waste rock areas.

Response Text

Text and Figures revised to remove reference to upland tailings; however, historical hand sorting operations generated three large waste rock piles that may contain high concentrations of metals.

2158 Draft | 4 | **14181**

Comment Text

Table 4.1-4, we do not believe that the Dayrock tailings impoundment (incorrectly called "TLGS PILE") is in the floodplain. Also,- we question whether there are "upland tailings" at the Dayrock Mine (OSB 039).

Response Text

As shown in Figure 4.1-22, the tailings pond and repository are shown in detail (and is not shown to be in the floodplain). The source area name Dayrock Mine TLGS Pile/SVNRT Repository is that provided by the BLM in the base GIS coverage used throughout the RI. In order to maintain consistency throughout the documents, the names have not been changed. Refinements to the names or associated source types are clarified in the text.

2159 Draft | 5 | **14182**

Comment Text

Page 5-3, last paragraph - it should be clarified that the estimated "gaining reaches" and "losing reaches" are specific to the flow

Response Text

This paragraph does not refer to the seepage study of Barton. Data were collected over

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measured the particular point in time this study was taken. It is expected that during high flows, "gains" would increase as the aquifer becomes saturated and few "loses" would occur upon saturation of the shallow aquifer.

time and represent periods of high, low, intermediate flows, etc. The computations of gaining and losing reaches are based upon the estimated expected or "average" values.

2160 Draft 5 **14183**

Comment Text

Page 5-4, fourth paragraph of Section 5.2 2 - It should be pointed out that the translators developed by EPA for TMDL ignored 95% of the data, thus inappropriately establishing a total to dissolved ratio instream of 1:1 for both zinc and cadmium and then inappropriately using this instream monitoring by applying this ratio to effluent discharges. Thus the translators are questionable at best, and of little value.

Response Text

As mentioned in the referenced paragraph, the translator values were calculated to provide a reference and point of discussion for total loads. Data sets and calculation methods are included in the Final TMDL document.

2161 Draft 5 **14184**

Comment Text

Page 5-7, first full paragraph - the statement is made that "Possible contributors to the dissolved and total metal concentrations and loads at NM291 are the tailings and other waste material at the Interstate mill site." According to Figure 4.1-4, NM29 1 appears to be above the Interstate mill.

Response Text

The first sentence of this paragraph will be changed to indicate that the Interstate-Callahan mine/rock dumps are possible contributors and not the Interstate mill site.

2162 Draft 5 **14185**

Comment Text

Page 5-13, first paragraph under Section 5.3.3 - the draft RI alleges that in Segment 2 "Large piles of rock debris" are large sediment sources. Direct evidence is needed to support the conjecture. As stated earlier in our comments, it has been our experience that historic waste rock areas are extremely stable and contribute little sediment. In fact, the MFG 1991 high flow study sampled both above and below the Interstate waste rock areas and both locations recorded TSS less than 1 mg/l. We believe the sediment yield in this reach is due to other sources than waste rock. In addition, the last sentence of this paragraph is baffling! How in the world can the elimination of direct tailings discharge to the stream only be "presumed" to reduce sediment yield?

Response Text

The statement referred to in the first part of the comment does not say that large piles of rock debris are probable sediment sources let alone "large" (reviewer's insertion) sediment sources. The paragraph just states the fact that these piles are positioned adjacent to the stream channel. The reviewer has misinterpreted and chnaged the significance of the statement by adding words.

Without direct measurements in the time frame before and after elimination of direct tailings discharge one can only assume or "presume" that the sediment yield has been reduced, even though it is highly likely or probable.

2163 Draft 5 **14186**

Comment Text

Page 5-47, Table 5.4-1, once again, there is not a Dayrock "Tailings Pile"; it is a tailings impoundment that has stable, vegetated embankments.

Response Text

Text corrected to identify this source area as the tailings repository.

2164 Draft **14187**

Comment Text

Attachment 4, page 1, third paragraph - the only "applicable" screening levels are those having met the legal requirements of both the federal and state administrative procedures acts (APA). For all screening levels not meeting the legal requirements of the APA, the draft RI must clarify that these are merely guidance values with no legal force.

Response Text

It is clearly stated that these values are used for screening purposes only to identify areas for further evaluation in the FS. Cleanup goals will be established in the ROD.

2165 Draft **14188**

Comment Text

Attachment 4, page 1, fifth paragraph - groundwater is "screened" against surface water due to groundwater discharges to surface water. This is curious since the draft RI attempts to ignore and downplay such interaction! In addition, Idaho has separate standards for both groundwater and surface in the Idaho regulations that have followed applicable APA requirements!

Response Text

The surface water/groundwater interactions in the basin are not ignored in the RI. Where data are available, results are presented. Very little groundwater data have been collected for the Basin areas outside of the BHSS.

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Also, dissolved groundwater results are screened against surface water criteria that are based on protection of aquatic life. Total groundwater results are screened against surface water criteria that are based on protection of human health. To be consistent with the HHRA, in this RI these are the MCLs.

2166 Draft — **14189**

Comment Text

Attachment 4, page 3, Table 2 - in addition to comments above concerning what screening levels are "applicable" and which are merely "guidance", lead DOES NOT have a MCL of 15 ug/1. This is a corrosion level indicator for public drinking water system distribution systems. If any MCL is used in this column, it should be the last health-based MCL for lead, i.e. 50 ?g/L. Otherwise the column should state "NA".

Response Text

EPA recognizes that 15 ug/L is not an applicable MCL for lead. However, this level is a recognized action level for Superfund Cleanup. See EPA memorandum from Henry L Longest and Bruce M. Diamond to Patrick M. Tobin, "Cleanup Level for Lead in Groundwater". June 21, 1990.

2167 Draft — **14190**

Comment Text

Attachment 4, page 4, Table 2 (continued) - the range of hardness values in the basin is much greater than the "30 to 100 mg/L" indicated. It must be pointed out that 25 mg/l is the lowest hardness value by regulation that can be used and the upper range hardness data in the basin is at least 150 mg/l. All hardness data is readily available from DEQ.

Response Text

As presented in the Final Background Technical Memorandum, the median hardness concentrations in the basin range from 6 to 40 mg/L for surface waters in the main stream channels; therefore, a hardness of 30 mg/L is a representative value for use in deriving screening levels.

Use of a higher hardness concentration in the screening evaluation would not affect conclusions of the RI for Ninemile Creek. Even if a hardness value of 100 mg/L was used to derive the AWQC for zinc (118 ug/L), of the 165 surface water samples analyzed for dissolved zinc in NMSeg04, 158 samples had measured concentrations greater than 188 ug/L (96%). Concentrations ranged from 3.9 to 9,830 ug/L in NMSeg04.

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1978	Draft	Glossary	141

Comment Text

This is "To be expanded for the final version" - how will the public be allowed to comment prior to the "final version"?

"Agricultural" is defined to "provide wildlife habitat"! Wildlife habitat in an agricultural setting is not the principal function. The plain meaning of the English language, as given in a dictionary, should be used.

"Aquatic" is defined as "relating to" water! What doesn't "relate" to water? Here again, the plain meaning of the English language must be used.

How can "political/societal relevance" be an "assessment endpoint" for natural resources and what faction constitutes the "political/societal" constituency?

Under "background concentration", stormwater runoff should be listed as an example of one of the "other anthropogenic sources".

The definition of "conceptual model" should include the concept that the model must be verified by comparison with actual monitoring data to determine the model accuracy.

"Contaminant" is already defined in federal regulations. Where any term is already defined in either federal regulations or an English dictionary, these definitions must be used. The RI process does not allow redefining the English language.

The concept of "co-occurrence" has no place in the definition of "exposure". Either "exposure" occurs or it doesn't. For example, would "co-occurrence" apply to an ecosystem where a mine site miles away from a stream contains very insoluble lead sulfide but "exposure" is presumed with fish in the stream?

The definition of "release" is not consistent with the CERCLA definition. In fact, the draft RI definition of "release" can be interpreted to include natural background concentrations of a substance. This definition must be consistent with the definition in CERCLA.

Conspicuous by its absence is the regulatory definition of "remedial investigation (RI)" found at 40 CFR §300.5. This definition must be included verbatim. Also, notably absent from the regulatory definition of the RI is the development of hypothetical models, which knowingly overestimate the extent of "contamination", which is prevalent in the draft RI. The regulatory definition of the RI states that the RI "emphasizes data collection and site characterization. . . sampling and monitoring, as necessary, and includes the gathering of sufficient information to determine the necessity for remedial action..." This sounds nothing like the draft RI. The draft RI erroneously attributes virtually all instream metal concentrations to ALL upland historic and active mining activities while either ignoring or downplaying natural and other non-mining sources of metals. Nowhere in the draft RI does EPA even attempt to identify any of the over 1000 mining sites as non-problems as the regulatory definition directs (i.e. ". . . information to determine the necessity for remedial action..."(emphasis added)). It appears that the failure to include the regulatory definition may have been intentional.

"Upper Background Concentration" is limited to two studies: Gott and Cathrall (1980) and "LeJeune and Cacela (1999). Neither

Response Text

The glossary has been revised to reflect terms used in the RI. Where applicable, the regulatory definintions or dictionary definitions are provided.

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study addresses either the potential metal loads from natural levels of metals in streambed materials or potential loads from the interaction of naturally mineralized groundwater with surface (including water produced from fault zones in mineralization). Clearly "sufficient information" has not been collected per the regulatory definition of RI.

"Wetland" is also a term, defined at 40 CFR §122 3, that must be used verbatim in the RI. The legal definition of a "wetland" is where water inundation/saturation frequency is ". .. sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions..." The draft RI expands on this legal definition by adding that ". . . inundation by water that facilitates habitat for aquatic organisms and/or water-related wildlife." Considering the obfuscated definitions above, cows could be considered aquatic wildlife.

1979 Draft **142**

Comment Text

Page 1-1, second paragraph - "refining" activities should also be included in the first sentence. Also, this paragraph of the draft RI states "The contamination resulted from the discharge or erosion of mill tailings, and other mine-generated waste". This is not entirely true. The Bunker Hill smelter/zinc plant/phosphate-fertilizer plant contributed (and still contributes) a large portion of the current metal loads to the system. For example, the Government Gulch Creek and drainage still contain levels of metals in both surface and groundwater (even after tens of millions of dollars in remediation efforts) that are orders of magnitude higher than surface water quality or groundwater standards. Neither mining nor milling occurred in this drainage.

The RI also fails to consider the impacts of lead-based paint, leaded gasoline and other sources, apparently by defining these significant sources as background.

Response Text

Text modified as per comment to include "refining" as a source.

The focus of the RI is to identify mining-related sources of metals contamination in the Basin. Exposure to lead-based paint is accounted for in the HHRA as a source of lead to residents in their homes. Leaded gasoline has added a more diffuse background source of lead to the environment. By using the background concentrations in conjunction with risk-based screening levels, locations with background concentrations of metals or less are screened out from further evaluation in the RI/FS process.

1980 Draft **143**

Comment Text

Page 1-1, third paragraph - the draft RI states "The basin, as evaluated in the remedial investigation, includes the watershed and floodplains of the South Fork and main stem of the Coeur d'Alene River..." What increase in the Coeur d'Alene River floodplain is attributable to the dam at the outlet of Coeur d'Alene Lake?

Response Text

Unknown.

1981 Draft **144**

Comment Text

Page 1-5, second paragraph - the draft RI states "Mills along the South Fork Coeur d'Alene River discharged most processing wastes..."(emphasis added) The term "processing" has a distinct regulatory definition that should be adhered to in the draft RI. "Milling" is not processing; it is beneficiation. Actual "processing", as defined by EPA, occurred in portions of the Bunker Hill Smelter and Zinc Plant and not at other mines and mills in the drainage.

The statement is also made that "...until 1968, when mills were required to impound tailings..." This is not correct. As of this 1968 date, the use of tailings impoundments was voluntary. Tailings impoundments were in use by some mills as early as 1928.

Response Text

The quote from Stratus (1999) has been annotated to indicate that "processing" means "milling."

1982 Draft **145**

Comment Text

Page 1-5, last paragraph - the actual quantities of tailings has not been decided and are under discussion in the current court proceedings.

Response Text

EPA acknowledges the legal positions of the Mining Companies expressed in these comments, as also expressed by these same Companies in litigation against the U.S. EPA disagrees with a number of these positions, but does not believe that comments or

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response to comments on the draft RI/FS reports are an appropriate forum for supporting respective legal positions.

1983 Draft — **146**

Comment Text

Page 1-6, first paragraph - a rather absurd calculation estimating the height on a football field, if all the tailings discharged to the basin were piled on this, is made. Aside from the fact that the hypothetical football field has no end zones and is not of regulation width, the draft RI should provide a useful comparison. For example, how many tons of tailings could have been removed from the system with the money spent on the RI? What is the purpose of such a comparison in a document that is supposed to be science based? Shouldn't the RI also point out that without the lead and zinc produced by the mines we may not have been successful in the country's involvement in two world wars?

Response Text

The text illustrating the hypothetical height of all the tailings if piled on a football field was developed to give the public an understanding of the magnitude of the issues being discussed. The text has been adjusted for the amount of tailings estimated by Long (1998) of 62 million tons of tailings and the dimensions of the football field noted as being approximately 100 by 50 yards (the true width of a football field is 53 33 yards).

1984 Draft — **147**

Comment Text

Page 1-6, second paragraph - re-milling of deposited tailings also occurred in the 1950's and 1960's. Further, the draft RI discusses the re-milling of tailings already deposited into the stream and states "This effort resulted in the production of additional flotation tailings. . ." Is EPA double-counting these tailings? The way this paragraph is worded it appears that these activities are negative things. Isn't it a fact that these re-milling activities reduce the amount of "contaminants" by removing metal values (i.e. production of a zinc concentrate containing other metal values, and not pure zinc) and that this is a good thing?

Response Text

Remilling of tailings both removed and dispersed metals in the basin; the paragraph has been modified to reflect both.

1985 Draft — **148**

Comment Text

Page 1-6, third paragraph - the draft RI states that "The tailings impoundments continue to release metals-contaminated water..." It should be noted that there are many discharges containing metals that are covered by permits under the NPDES permit program and these discharges should not be treated in the same manner as historical tailings in the floodplain.

Response Text

Permitted discharges from the impoundments release metals-contaminated water to surface water. The paragraph acknowledges that these releases have been reduced over time in response to the Clean Water Act, underwhich the NPDES system operates.

1986 Draft — **149**

Comment Text

Page 1-8, Section 1 2.4.4 - federal actions conducted at the Charles Dickens and Silver Crescent mine & mill sites are discussed. What were the total costs of these federal actions at these sites? Further, what are the results of monitoring at downgradient surface water and groundwater sites from the repository compared with monitoring results of upgradient sites?

Response Text

The cost of these actions is irrelevent to the analysis presented in the RI.

Available data are presented in the RI. A detailed analysis of the impacts of these actions has not been performed.

1987 Draft — **1410**

Comment Text

Page 1-11, last paragraph - the Morning No. 6 adit system was in use by 1987 and is a wetland treatment system built on top of the "waste rock dump". Water infiltrating through the waste rock is collected and discharged to the South Fork under a NPDES permit.

Response Text

See response to Comment #1913.

1988 Draft — **1411**

Comment Text

Page 1-12, first paragraph under Section 1.2.4.9 - the draft RI mentions work conducted on "the Osburn football field". Is this meant to be the baseball field?

Response Text

No, the football field.

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1989 Draft — **1412**

Comment Text

Page 1-17, second paragraph of Section 1 3 - the draft RI states "A good portion of the Basin consists of federally managed lands. . ." What percent of this federally managed land includes floodplains, and other areas, allegedly contaminated by mining activities?

Response Text

This analysis has not been done. Land ownership is irrelevent to the analyses presented in this RI.

1990 Draft — **1413**

Comment Text

Page 1-18, first paragraph - apparently for some political reason, the draft RI states that "...81 percent of the study population resides in Washington and only 19 percent of the study population resides in Idaho." Was the 81% of the study population studied? What removal actions and blood lead studies have been conducted in Washington? This same paragraph must also estimate the total percent of the alleged "contamination" in Idaho vs. Washington. Wouldn't Idaho have over 99 percent of this alleged "contamination"?! Further, why shouldn't the RI include an honest comparative risk analysis to human health between alleged "contamination" in the Spokane River vs. exposure to vehicle emissions (numerous carcinogens and poisonous gases) in downtown Spokane?

Response Text

The purpose of the RI does not include assessment of risks from vehicle emissions and other non-mining sources.

1991 Draft — **1414**

Comment Text

Page 2-1, first paragraph - the draft RI states "The detailed CSM is published under separate cover (CH2M HILL 2000)." Has this conceptual site model been subjected to a valid peer review process (agency and private sector)? If so, what were the weakness/problems identified? If not so peer reviewed, why not?

Response Text

The CSM was developed during the course of numerous meetings with stakeholders and the public beginning in 1997 (See Part 1 Section 4). Comments were given at the time and incorported into the CSM. Background documents on these meetings are available for review in the Administrative Record.

1992 Draft — **1415**

Comment Text

Page 2-1, last paragraph - the draft RI states "...types of waste sources, mechanisms of release and transport of waste, and the natural resources affected by the release of wastes are similar in each CSM unit." As explained in comments on individual CSM units, the draft RI neither identifies all sources nor attributes loads according to a sound scientific method. Further, for all CSM units, the draft RI fails to evaluate the accuracy of the model with actual monitoring results.

Response Text

EPA affirms its understanding, as the Companies point out, that the objective of the RI/FS process is not the unattainable goal of removing all uncertainty, but rather to support an informed risk management decision. EPA believes that the more than 10,000 samples collected to support the RI/FS, and an additional 7,000 samples collected by other stakeholders in the basin over the last 10 years, provide a solid basis to support informed risk management decisions for the Coeur d'Alene Basin mining contamination.

1994 Draft — **1417**

Comment Text

Page 2-4, first paragraph - the draft RI states "Canyon and Ninemile Creeks also have the highest concentrations of metals among the larger tributaries (with the possible exception of the creek within the Bunker Hill Superfund Site)." Is this unnamed creek Government Gulch Creek? Even with the limited monitoring data readily available to us we see that as late as the year 2000 surface water in Government Gulch Creek contained cadmium as high as 240 ?g/L and zinc as high as 8,980 ?g/L. How many tens of millions of dollars have been spent on remediation efforts in this watershed to date?

Response Text

Text referencing a specific creek removed in response to other previous comment.

The amount of money spent ot date in the BHSS is irrelevent to the analysis presented in this RI.

1995 Draft — **1418**

Comment Text

Page 2-15, first full paragraph - lead shot must be mentioned as a source of "lead-contaminated sediment" in this area.

Response Text

The Fish and Wildlife Service and many others (as summarized in Stratus 2000) have studied the relationship between waterfowl mortality and sediment lead concentrations.

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The results of these studies indicate that the most important contributor to waterfowl mortality is the incidental ingestion of contaminated sediment associated with aquatic vegetation and direct consumption of contaminated sediemtns for use as grit.

1996 Draft **1419**

Comment Text

Page 2-17, Section 2.5 3 - the potential impact of many decades of stormwater runoff (with associated heavy metals) from Interstate 90 must be mentioned as a source of heavy metals in the Wolf Lodge Creek watershed.

Response Text

The non-mining related sources of metals listed in the comment contribute to the background concentrations of metals observed in soil, sediment, and surface water. By using the background concentrations in conjunction with risk-based screening levels, locations with background concentrations of metals or less are screened out from further evaluation in the RI/FS process.

1997 Draft **1420**

Comment Text

Figure 2 2-1 - this figure appears to indicate, incredibly, that there is no groundwater/surface water interaction where groundwater loads metals to the surface waters of Canyon Creek. Is this so? If this is the allegation, what is the science verifying that such groundwater loading to surface waters of Canyon Creek does not occur?

Response Text

Figures in this section updated for consistency with EcoRA.

1998 Draft **1421**

Comment Text

Figure 2.2-2 - does the inset "See Figure 2.3-1" mean "See Figure 2.2-1"? Also, there is no explanation in the preceding text on the source of the numbers in the "Tailing" box. There is no such thing as the Star Tailings Ponds consisting of an "Upper Pond" and "Lower Pond". There are six individual ponds with only one (the most downgradient) active. Further, what is meant by the "Seepage" column items of "Spring 80#/day, Fall 32#/day" for the supposed "Upper Pond" and "6-8 #/day" for the supposed "Lower Pond"? Pounds/day of what? How is this "Seepage" calculated?

Response Text

Figures in this section updated for consistency with EcoRA.

1999 Draft **1422**

Comment Text

Page 3-18, second paragraph of Section 3.3.1.1 - the draft RI states that "The primary sources of metals observed in surface water and groundwater are ores, disseminated tailings, tailings piles, and waste piles located within the basin." Please explain how "ores" are a primary source. We would agree that ore grade material in outcrops, streambeds, or in fault zones act as sources of natural metals to both groundwater and surface waters but, to our knowledge, there are no piles of mined ores laying around the basin. Further, how does EPA define "tailings piles"? If EPA includes tailings impoundments as "tailings piles", this is not a correct use of the term. A "tailings impoundment" is a defined term by Idaho law. Such structures are regulated by the Idaho Department of Water Resources and, where discharge to surface water occurs, are also regulated by a NPDES permit. A "tailings pile" would be just that - an uncontained pile of tailings.

Further, what are the criteria for being considered a "primary source"? According to the definition of a "remedial investigation" discussed in comment #1 above, monitoring data is required to substantiate what is and isn't a "source". What percent of the total load in the basin is due to "disseminated tailings"? All of the mining related loading from the Coeur d'Alene River mainstem down in the system is 100% disseminated tailings. What percent would disseminated tailings be in the mainstem South Fork (recalling that permitted discharges must be considered separate from other sources)? Basically, the RI must contain monitored proof of a sources contribution rather than unsubstantiated presumptions that the mere existence of a source on a stream reach means that

Response Text

Ores are considered a source because they are one of the original sources of the metals contamination in the Basin. The distinction between tailings piles, impoundments, or ponds is based on observations, not a legal definition. For the RI, whether a pile, pond, impoundment, or outfall is permitted or not is irrelevent. They may all contain elevated concentrations of metals which are impacting surface water quality.

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source is responsible for metals in the surface waters of that reach.

2000 Draft — **1423**

Comment Text

Page 3-48, second full paragraph - the draft RI mentions "...development of roads, mines, mill sites, and smelters." There was only one "smelter" in the basin.

Response Text

Text modified to reflect the single smelter.

2001 Draft — **1424**

Comment Text

Page 3-50, third full paragraph - the draft RI discusses metals in sediments along the Spokane River. Where are these sample sites in relation to any stormwater discharge points? As stated in comments above, EPA is fully aware of the high levels of metals associated with stormwater runoff from non-industrial areas.

Response Text

It is well documented that elevated concentrations of metals in suface water from Coeur d'Alene Lake are impacting the Spokane River (See Ecology 1998). Contributions from stormwater are accounted for in the surface water background concentrations.

2002 Draft — **1425**

Comment Text

Page 3-50, last paragraph - the draft RI addresses the fishery in the Spokane River. What are the recreational fishing impacts and restrictions and how do these factors affect fish populations in this and other areas?

Response Text

Risks to aquatic wildlife in the Spokane River are addressed in the EcoRA.

2003 Draft — **1426**

Comment Text

Page 3-51, second and third paragraphs - the draft RI discusses alleged lead mortalities and alleged source of metals as being solely ". . . hazardous substances released from mining and mineral-processing facilities". Once again, the political vs. the scientific nature of the draft RI is evident due to the failure to address lead shot as a source. As addressed in comment #17 above, lead shot is being identified as the cause of 155 swan illness/deaths in two Washington state counties.

Response Text

See response to Comment #1995.

2004 Draft — **1427**

Comment Text

Table 3.2-2 - the draft RI must also address potential erosion of these metals from natural sources into the floodplain system (estimated range of tons of metals naturally eroded).

Response Text

The non-mining related sources of metals listed in the comment contribute to the background concentrations of metals observed in soil, sediment, and surface water. By using the background concentrations in conjunction with risk-based screening levels, locations with background concentrations of metals or less are screened out from further evaluation in the RI/FS process.

2005 Draft — **1428**

Comment Text

Page 4-3, steps of the DQO Process - why wouldn't "Identify the Problem" be "step 1"?

Response Text

The seven steps of the Data Quality Objectives process developed by EPA as guidance for conducting remedial investigations, are presented in the RI verbatum from the EPA guidance document.

2006 Draft — **1429**

Comment Text

Page 4-4, first paragraph of Section 4.2.2 - the draft RI mentions "the large amount of information" on contamination in the basin since 1930. What water quality improvements have occurred since implementation of both the use of tailings impoundments and the 1972 Federal Water Pollution Control Act? If the draft RI is going to acknowledge historic "contamination", why not also acknowledge improvements? The scientific basis is there to address this issue but is a political agenda preventing discussing the fact

Response Text

EPA is concerned not only about releases from past mining practices but present and future releases from such secondary sources as riverbeds and riverbanks. The RI is an assessment of current conditions. Data are not sufficient to allow an analysis of improvements or reductions in metals loading over time.

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of water quality improvements? Likewise, shouldn't the discussion include improvements since the baghouse fire in 1973 and the shutdown of the smelter in 1982?

2007 Draft 1430

Comment Text

Page 4-16, Task 3 - the draft RI discusses surface water sampling. In other sections of our comments we address problems of historic sampling comparisons (i e. during upgradient remediation activities, during post-remediation period prior to stabilization, samples taken during ascending vs. descending hydrograph limbs, etc.). An additional concern that should be addressed is the filtration of samples for dissolved metals analysis. We understand that the USGS (Dr. Arthur Horowitz?) prepared a paper describing how the method of sample filtration prior to analysis can produce varying ranges of dissolved metals on identical samples. How exactly were the filtration procedures for dissolved metals handled and, based upon how they were filtered, how could this distort the analysis data? Since water quality standards are based upon dissolved metals, this question is very important. Further, it is curious and inappropriate from a scientific standpoint for the draft RI to focus on total lead rather than dissolved lead.

Response Text

Dissolved metals are operationally defined as metals which pass through a 0.45 micrometer membrane filter. Dissolved metals samples collected for the RI by EPA and the USGS were filtered in the field using standard, commercially available 0.45 micrometer membrane filters. As presented in the Horowitz paper (The Effect of Membrane Filtration Artifacts on Dissolved Trace Element Concentrations. Wat. Res. Vol. 26, No. 6, pp 753-763, 1992), a number of factors associated with filtration can affect "dissolved" trace element concentrations. We acknowledge that sampling variability can affect results. We also acknowledge that measured concentrations in surface water are also variable due to many natural processes including metal sources, quantities of flowing water, mixing processes as water flows downgradient, and the degree to which metals enter and remain in the water column (see Part 2, Canyon Creek, Section 5.4.1.1). This natural variability is much greater than the variability introduced into the process from filtration. This natural variability is addressed in the RI through the use of the probabilistic model.

Also, the variability that is introduced by the filtration process has little impact on the conclusions of the RI which clearly shows that measured dissolved zinc concentrations in the Basin routinely exceed AWQC by factors of 2 to more than 100.

Both total and dissolved lead concentrations in surface water are addressed in the RI. Total lead was highlighted, along with dissolved cadmium and zinc, to illustrate fate and transport behavior of metals that tend to be found in the total phase or the dissolved phase. Note that in Canyon Creek Segment 5, 236 surface water samples were collected and analyzed for dissolved lead. Results for 225 of these samples exceeded the dissolved lead screening level of 1.09.

2008 Draft 1431

Comment Text

Page 4-17, third paragraph of Section 4 2.3.6.1 - the draft RI discusses garden sampling. We understand that there is a national controversy concerning metal levels in fertilizers. How are metal sources in soil amendments accounted for in either garden or agricultural soil sample results?

Response Text

Soils samples were collected from residential gardens and in some cases, vegetables grown in residential gardens were also sampled. Risks to human receptors from these exposure routes were evaluated in the HHRA. If concentrations were greater than EPA action levels, residential soils were remediated.

2009 Draft 1432

Comment Text

Page 4-18, Task 4 - indoor dust sampling is discussed. How do the results for lead compare with the results of EPA's "Three City Urban Soil-Lead Demonstration Project" (no mining sources) in both levels and forms of lead compounds? Further, why weren't paint chips taken from all residences rather than less than half of the sampled residences? Since paint is a significant source of lead

Response Text

These issues are addressed in the HHRA.

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in homes, how can this significant factor be left out?

2010 Draft **1433**

Comment Text

Page 4-32, Task 10 - we understand the concept of the proposed synoptic sampling but the draft RI does not appear to explain the results of this task. Are the sample results in Table 4 2-1 (labeled "USGS 1999 Synoptic Sampling Event") of Part 4, CSM Unit 3 - Lower Coeur d'Alene River and Floodplains, from Task 10? If so, the data presented shows lower flows at downgradient locations in certain instances and the sampling in the South Fork alone was spread over three days (four days for the entire length of the rivers sampled). For example, at an average stream flow velocity of 5 ft/sec for a high flow event, this is equal to almost 82 miles of travel in one day. Was the objective of this task met? Does the draft RI only present a portion of the information? An explanation of the synoptic sampling event must be included in the draft RI for public comment if this information is to be used in the RI. Perhaps we overlooked this explanation somewhere in the current draft RI?

Response Text

1. Yes, the results in Table 4.2-1 of the Lower CDR report are from Task 10. All data as reported in the USGS report are included in the RI.

2. The USGS synoptic sampling is presented in a separate USGS report that is included in the Administrative Record (Woods 2000). Hydrographs for the flow event are shown for each location and the point in the hydrograph where the samples were collected are shown. Not all samples were collected at the peak of the hydrograph, which could account for why stream discharges may appear to decrease at some downgradient locations on the South Fork.

3. The objectives of the study were to show during a high flow event how concentrations of metals fluctuate and show relative contributions of metals to the South Fork and Mainstem from tributaries. This was achieved. For dissolved zinc, the report states:

"The O'Brien Gulch station carried 4 13 lb/day of dissolved zinc which had increased to 5,136 lb/day at the Pinehurst station. Canyon Creek added 1,391 lb/day, the other 12 tributaries added another 1,035 lb/day. The tributary loads accounted for 47.3 percent of the increase between O'Brien Gulch and Pinehurst stations. The dissolved zinc load of 6,000 lb/day at the Harrison station was mainly derived from the South Fork."

2011 Draft **1434**

Comment Text

Page 4-33, first paragraph of Section 4 2.4 2.1 - the draft RI admits that for the 1,080 "mining-related source areas in the basin... Less than 5 samples were collected from the majority of these source areas; therefore, data are not available to directly evaluate most of the source areas." This appear to an incredible fatal flaw in the RI process but does explain the mere allegation of primary sources" contained in the draft RI. What is EPA's reasoning on this lack of monitoring data?

Response Text

EPA believes that the more than 10,000 samples collected to support the RI/FS provide a solid basis to support informed risk management decisions for the Coeur d'Alene Basin mining contamination.

2012 Draft **1435**

Comment Text

Page 4-34, first two paragraphs - EPA falsely assumes that all of the 1080 identified mining-related sites behave the same. Some of the larger sites located directly alongside a stream may contribute metals to the system, but if these "obvious" sites are equated with the majority of the sites that do not, in actuality, present any problem, then any model will seriously overestimate a "problem" due to the site category. This process would equate an exploration site, where no ore was discovered, to sites with ore production. This also ignores actual metal levels in waste rock at different sites.

Response Text

Untrue. Major contributors of metals to the creeks and river were identified by an initial analysis of dissolved zinc concentration increases in surface water. Mining-related sources in a reach with increasing dissolved zinc concentrations were identified and additional soil, sediment, seep, adit and groundwater data analyzed to confirm the initial findings.

All potential source areas are listed in the RI. This list was reduced to a short list of major contributors that are the focus of the FS.

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2013 Draft — **1436**

Comment Text

Page 4-35, last paragraph - the draft RI states that "Paint chips were only collected from residences with observed chipping or pealing paint." This assumption could result in the failure to sample a home where the actual historic lead paint, thus dust levels, could be greatest due simply to a fresh coat of paint.

Response Text

These issues are addressed in the HHRA.

2014 Draft — **1437**

Comment Text

Pages 4-43 through 4-45, what are the units for the measurements? Also, are the TDS & TSS results for the first four sample results indeed identical? This TDS/TSS duplication is also apparent on page 4-44 & 4-45. Further, this is carried on to the "Hardness" and "Alkalinity" columns on page 4-45. Page 4-44 also reports pH values of "76" and "44".

Response Text

This table is not a summary of results but a summary of the number of samples collected for each field sampling event and what they were analyzed for.

2015 Draft — **1438**

Comment Text

Page 5-10, last paragraph - the draft RI states "The limited information on groundwater that is available for the basin does not allow a general estimate of background." The purpose of the RI is to collect such monitoring data.

Response Text

Additional groundwater data may be collected as needed to support design of selected remedial actions.

2016 Draft — **1439**

Comment Text

Page 5-11, first paragraph - how does EPA resolve the fact that "baseline" in areas where mineralization is insufficient to warrant mining can logically represent a "baseline" in mineralized/faulted area where ore grade material is actually found? The natural background materials attached to these comments show how high surface water metal levels can be in pre-mining mineralized areas (Red Dog).

Response Text

The background summary section has been substantially revised. The calculation methods and data are included in a Technical Memorandum included as Appendix B to the EcoRA and in included in Administrative Record.

2017 Draft — **1440**

Comment Text

Page 5-12, first paragraph - the draft RI discusses the use of Mill Creek and Gentle Annie Gulch "….where there are surface expression of mineralized veins and ore bodies". This ignores potential loads associated with faults and mineralized groundwater interactions.

Response Text

The background summary section has been substantially revised. The calculation methods and data are included in a Technical Memorandum included as Appendix B to the EcoRA and in included in Administrative Record.

2018 Draft — **1441**

Comment Text

Page 5-18, Section 5.3 2.4.4 - all of these "groundwater seepage studies" occurred during low flow periods. What happens to surface/groundwater interactions during periods of high flow when the shallow aquifer is saturated?

Response Text

The results of the seepage study (Barton 2000) indicate that groundwater/surface water interactionsin this area are complex and specific stream reaches will vary between gaining and losing seasonally due to precipitation and discharge rates.

2019 Draft — **1442**

Comment Text

Page 5-21, Section 5.3 2.10 and page 5-85, Table 5.3-1 - the draft RI states "Hecla collected mass loading data at 11 adit drainages in 1991". We believe that this is the MFG 1991 study data collected at Hecla sites by MFG. The study was paid for by the SVNRT and Hecla.

Response Text

Text modified to indicate that MFG collected and reported the data on behalf of Hecla and the SVNRT.

2020 Draft — **1443**

Comment Text

Page 5-22, last paragraph - the draft RI states "...fate and transport mechanisms were used, as required, to interpret model results." It

Response Text

Estimated expected values are presented with measured values in the spreadsheets in

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appears from this statement that probabilistic model results are interpreted by other models but nowhere in the draft RI can we find a direct comparison of what the CSM predicts vs. actual sample results for a site at a given flow. This is necessary to establish the accuracy of the hypothetical model vs. reality.

the appendices.

2021 Draft **1444**

Comment Text

Page 5-23, Section 5.4.1.2 -the draft RI states "...an equation was written to estimate the acid- or base-generating potential of a specific location containing a variety of ores and minerals." How well is this "equation" verified in the field with actual monitoring results?

Response Text

The equation is a quick and rough estimate of the acid-generating potential of an ore body based on the assumption that the only sources of sulfate are ferric sulfate, lead sulfate, and zinc sulfate. Further, it is assumed that all the ferric iron hydrolyses completely which will only occur when the pH is greater than, approximately, a pH of 5. This equation has some advantages over laboratory methods (e.g., the Schafer and Sobek Methods) that try to sequentially extract and differentiate nonacid- and acid-producing sulfur forms.

Reece (1974) had batch, column, and field data from the BHSS with which to compare the predictions. As mentioned, the predictions are rough and depend on the rock types.

2022 Draft **1445**

Comment Text

Page 5-24, first full paragraph - the draft RI discusses the use of a model "...because it fits the data as well as other surface complexation models..." This could mean "all the models are bad but this is the least bad". What is the actual "fit" of the model/data?

Response Text

As can be seen in Table 5.3.6-1 of Part 7, the results are at least qualitative in that cadmium and zinc are predominantly in the dissolved form and lead is predominantly in particulate form. We feel the results give good predictions. The reviewer can judge for himself using the aforementioned table and measured data.

2023 Draft **1446**

Comment Text

Page 5-32, last paragraph - the draft RI discusses the probabilistic model and lognormal distributions of data on flows and metals, then states "The fits are good approximations that reflect the fact that no theoretical distribution ever exactly fits real world data, which are of limited quantity and subject to measurement errors." This is an incredible statement! The model is based upon "real world data" analysis and then both the quantity and accuracy of the data is criticized while at the same time inferring that hypothetical monitoring results are more accurate than actual monitoring data! Please explain how this is supposed to support the RI effort.

Response Text

The reviewer seems to have misinterpreted the statement and concept involved. Nowhere is it stated or implied that the probabilistic results are more accurate than the actual data. The quoted statement says the opposite that "no theoretical distribution exactly fits real world data--" and an exact fit is impossible because we do not know the actual distribution because we have a limited number of samples and because of measurement errors. .

2024 Draft **1447**

Comment Text

Page 5-34, last paragraph - the draft RI discusses "Approximately 100 measurements... taken periodically between 1991 and 1999" at the USGS sampling station at Pinehurst on the South Fork Coeur d'Alene River. With the tens of millions (hundreds?) of dollars spent upstream of this site in the 1990s, it is not possible to assume the samples at this location are measuring the same thing. This exercise is meaningless.

Response Text

Data can be used to help determine the impacts of money spent upstream and to evaluate the current situation. Without knowledge of the current situation and impacts to water quality from previous efforts, the most effective treatments cannot be discerned.

2025 Draft **1448**

Comment Text

Page 5-65, Tables 5.1-2 through 5.1-5 - there is no such thing as a MCL of 15 ?g/L for lead. Further, MCLs only apply to treated water at the consumers tap and not in untreated surface waters. The draft RI must clarify that "screening levels" have no legal effect.

Response Text

See response to Comment #2146.

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Upper South Fork

2-CSM Unit 1, Upper Watersheds

2168 Draft — 1 — **14191**

Comment Text

Page 1-1, first paragraph - the draft RI states "The watershed has been affected by mining activities and past and continuing releases of mining wastes." Virtually all of the "releases" are due to "past" activities of discharging tailings directly to the stream. These "releases" occurred solely upon discharge from the mill(s) and the water quality now exhibited in the stream(s) is the result of the past "releases". Further, the fishable/swimmable goal of the CWA is being met in the South Fork of the Coeur d'Alene River above Wallace even with the active mining operations and historic impacts of human activities in the watershed.

Response Text

See response to Comment #2026.

2169 Draft — 1 — **14192**

Comment Text

Page 1-1, fourth paragraph - we are not sure what the "Lucky Friday Waste Impoundment" is. Is this a tailings impoundment or waste rock storage area?

Response Text

Text corrected to indicate this is the Lucky Friday Tailings Pond.

2170 Draft — 1 — **14193**

Comment Text

Page 1-1, fourth paragraph - the draft RI states "A channel with wetlands planting is also included to collect identified seeps from the toe of the Morning Mine Waste Dump (MFG 1999)." These "seeps" are currently collected and discharged as authorized by a NPDES permit. Any activities in this area would require the remediating party to coordinate activities with both Hecla and EPA to address permit limitations.

Response Text

Text added to indicate this is a permitted discharge.

2171 Draft — 1.1 — **14194**

Comment Text

Page 1-2, second paragraph of Section 1.1 - the draft RI states "Above Larson, metals concentrations rarely exceed ambient water quality criteria (AWQC)." Natural levels of metals in the watershed exceed AWQC. Attached to Hecla's draft RI comments are materials related to natural background, including DEQ samples of springs above Larson that exceed AWQC.

This paragraph of the draft RI further states "the effects of degraded habitat and water quality are reflected in the observed fish populations." In early 1993, in recognition of the fact that although AWQC are exceeded in the South Fork above Wallace but the designated use is supported, EPA and DEQ signed an agreement with Hecla to develop site-specific water quality criteria as allowed by both law and regulation.

Response Text

This report focuses on measured metals concentrations in the main stream channel where above Larson AWQC are rarely exceeded. Individual seeps in this area may contain higher concentrations of metals (as per the IDEQ data) but when discharged to the main stream channel, the concentrations are diluted with lower concentration waters coming into the main stream channel.

2172 Draft — 2 — **14195**

Comment Text

Page 2-5, first full paragraph - the term "mine drainage (Ridolfi 1999)" is used. This term is a defined regulatory term and its use must be limited to the regulation definitions.

Response Text

"Mine drainage" in this context is not used in a regulatory context, so that any regulatory definition is not required.

2173 Draft — 2 — **14196**

Comment Text

Page 2-5, third paragraph of Section 2.2.1 - the draft RI states "Faulting and fracturing by natural tectonic processes. .. have increased the otherwise low permeability in the Belt rocks in some areas." The draft RI must also recognize the fact that these natural faults through mineralized areas are potential sources of metals to both surface and groundwater systems.

Response Text

Non-mining related sources of metals contribute to the background concentrations of metals observed in soil, sediment, and surface water. By using the background concentrations in conjunction with risk-based screening levels, locations with background concentrations of metals or less are screened out from further evaluation in the RI/FS process.

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Upper South Fork

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2174 Draft — 2 — **14197**

Comment Text

Page 2-9, first paragraph under Section 2.3 2.1 - the draft RI discusses estimated discharges for the "Upper South Fork Watershed". Other sections of the draft RI (i.e. Ninemile Creek and Canyon Creek) contained a discussion on the accuracy of estimated discharges vs. both the full data set for the 1999 water year and historic single measurements. Please add this discussion to this portion of the draft RI also. In addition, a graph of the estimated 1999 discharge vs. the actual monitored data is necessary.

Response Text

Text has been modified. The monitored station, near Mullan, and estimates for discharge at Wallace are located in different reaches of the Upper South Fork. As such a graph comparing the two stations would not be relevant.

2175 Draft — 2 — **14198**

Comment Text

Page 2-10, second paragraph - the draft RI discusses annual precipitation at the Woodland Park Station. When comparing this data with other watersheds, a discussion of watershed elevations should be included. For example, the percentage of the drainage at differing elevations, at either 500 or 1000-foot intervals, would give an indication of the percent precipitation as rain vs. snow. Daily snow elevations should be available from the local ski areas. Such information may help explain differences in daily flows between watersheds of similar area and total precipitation.

Response Text

This was examined; however, stream discharge is very dependant on snowmelt. Direct comparison to precipitation, temperature and other parameters yields significant uncertainty which is difficult or impossible to quantify.

2176 Draft — 2 — **14199**

Comment Text — Figures 2 3.1-1 and 2.3.2-2

Figures 2.3.1-1 & 2.3.2-2 - could this graph be modified to show precipitation as either snow or rain?

Response Text

Yes, however the proposed graph adds little because the basin is variable in elevation and precipitation occurring as snow. Average precipitation and snowmelt data added to Table 2.3 2-2.

2177 Draft — 2 — **14200**

Comment Text — Table 2.1-1

Page 2-17, Table 2.1-1 - the value of this table for the RI is questionable. The production numbers are not proven to be accurate, and no recognition is given for the use of tailings ponds. The data has little or no bearing on the discussion in the draft RI.

Response Text

The production numbers are considered to be reasonably accurate. The intent of the table is not to document tailings disposition.

2178 Draft — 3 — **14201**

Comment Text

Page 3-1, second paragraph - it should be pointed out that "human activities" such as fire suppression and thinning (to reduce fuel load) may also decrease the sediment transport of a "natural process".

Response Text

The reviewers comment is appreciated. Fire suppression and thinning may reduce the damage due to forest fires and associated devegetation.

2179 Draft — 3 — **14202**

Comment Text

Page 3-1, fourth paragraph - the draft RI states that "Sediment transport occurs at even the smallest of stream channel discharge. . ." Please describe the lower detection limit of the monitoring methods used to determine "sediment transport".

Response Text

Sediment transport measurements were successfully completed at discharges as low as 18 cfs.

2180 Draft — 3 — **14203**

Comment Text

Page 3-2, first paragraph - the draft RI states that there are no "sediment transport" monitoring events for the Upper South Fork but, due to the "similar" size drainage areas and land uses, Ninemile Creek and Canyon Creek monitoring can be used for "likely magnitude of sediment transport from the Upper South Fork." We believe that this is not appropriate for the following reasons: 1) Interstate 90 parallels much of the Upper South Fork, 2) the Upper South Fork has over twice the drainage area of Canyon Creek and 4 times the drainage area of Ninemile Creek, 3) the MFG 1991 high flow study event showed Upper South Fork flow over twice that of Canyon Creek and over 7 times that of Ninemile Creek, 4) farming/forestry activities are different on federal vs. private land,

Response Text

Comment is noted. To use consistent methods and available data for other sections of the report Canyon Creek and Ninemile Creek were used. It should be noted that this level of analysis only yields "likely magnitudes".

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and 5) timeframes of active mining activity is different. Monitoring is necessary, at both storm and low flow events.

2181 Draft | 3 | **14204**

Comment Text

Page 3-3, third paragraph - the draft RI states that the IDEQ/BURP data "will be incorporated into the Draft RI report". Based upon this statement, it appears that the public will be provided another opportunity to comment on the draft RI. Is this correct?

Response Text

This is a typo left from the Preliminary Draft. IDEQ BURP results are included in the Draft and Final RI report for stream segments where they are available.

2182 Draft | 3.2.3 | **14205**

Comment Text

Page 3-5, beginning with the third paragraph of Section 3.2.3 - Interstate 90 is not mentioned as a source for any of the stations. Both tailings underlying I-90 and construction rock itself may be sources. In addition, historic tailings under any developed area (cities, roads, etc.) must be considered sources.

EPA must also have stormwater runoff date for major interstates in the stormwater database. In addition, EPA's Nationwide Urban Runoff Program (NURP) recommended load estimates for total suspended solids (TSS) of 180-548 mg/L (57 FR 41237). These two sources (I-90 and urban areas) must be included where appropriate.

Response Text

Text has been modified.

2183 Draft | 4 | **14206**

Comment Text

Page 4-1, first paragraph of Section 4.1 - the draft RI identifies antimony, arsenic, cadmium, copper, iron, lead, manganese, mercury, silver, and zinc as "metals of potential concern". EPA's NURP study referenced above also identified numerous metals detected in stormwater runoff in non-industrial areas including load estimate recommendations for copper (43-118 ?g/L), lead (182-443 ?g/L), and zinc (202-633 ?g/L). These metals are not infrequent in urban stormwater runoff. Copper was detected in 91% of all NURP samples, lead and zinc were detected in 94% of all samples, arsenic in 52% of the samples, and cadmium in 48% of all NURP samples. Stormwater runoff from non-mining areas (urban and commercial) must be listed as sources of these metals.

Response Text

Purposes of the RI do not include assessment of risks from stormwater and other non-mining sources.

2184 Draft | 4 | **14207**

Comment Text

Page 4-3, last paragraph - the erroneous nature of the draft RI "identified source areas" can be highlighted by looking at Canyon Creek "sources" and Upper South Fork "sources". The draft RI for Canyon Creek refuses to acknowledge floodplain historic tailings and natural background (non-mining related) as realistic sources, but does list 127 mining areas as sources. Metal levels in Canyon Creek are much higher than the Upper South Fork even though the draft RI identifies 309 mining "source areas" (2.4x more than Canyon Creek) in this Upper South Fork segment where a healthy trout population exists.

Response Text

Major source areas identified for further evaluation and potential cleanup were based on increases in dissolved zinc concentrations and loads in each watershed. Six major source areas were identified in the Upper South Fork where estimated zinc loading at sampling location SF228 is approximately 90 lbs/day. In Canyon Creek, nine major source areas are identified where estimated zinc loading at sampling location CC288 is approximately 700 lbs/day. These are based on measured metals concentrations in surface water. As shown in these examples, the number of source areas in a watershed is not necessarily correlated with impacts to streams. Impacts to streams generally depend on the proximity of a source to a stream channel, water flow through the source, grainsize of the source material, and chemical composition of the source material..

2185 Draft | 4 | **14208**

Comment Text

Page 4-3 & 4-4, last sentence of 4-3 - the draft RI states "Groundwater collected from the South Fork Coeur d'Alene River Impacted Floodplain showed concentrations of dissolved antimony and lead, along with numerous concentrations of zinc that exceeded 110x and 110x the screening levels." Where was this "groundwater" collected? The figures and data summary tables do not include

Response Text

Correct. No groundwater samples were collected from this watershed segment. Text corrected to reflect surface water results for this source area.

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either sample locations or analysis results.

2186 Draft — 4 — **14209**

Comment Text

Page 4-4, Section 4 1.1.6 - the Upper South Fork water quality already meets the CWA fishable/swimmable goal as previously commented above. A realistic "problem" does not appear to exist, thus "major source areas" have no significance, except on a relative basis. For the six "major source areas" listed, illegal trespass and eating dirt/rocks appears to be the only "threat" to human health. Further, it is hard to understand the inclusion of "Gold Hunter No. 6" since this area is within the Lucky Friday surface complex and the adit water is used in the mill as feed water, ultimately discharging via a permitted (NPDES) outfall.

Response Text

As clearly shown in Attachment 2, dissolved zinc concentrations in the River routinely exceed NAWQC for protection of aquatic life.

The source areas presented in the RI rely on the BLM source area list and GIS coverage. Though the Lucky Friday complex and the Morning No. 6 are adjacent, they had historically different operators/history and are therefore kept separate in this evaluation.

2187 Draft — 4 — **14210**

Comment Text

Page 4-4 & 4-5, last paragraph (continued) - how can "tailings impoundments", a "millsite", or "railroad embankment fill" be classified as "geologic units"?

Response Text

As defined by Box et al 1999 "A surficial geologic map is a representation of the character and origin of
materials that occur at or near the present land surface (Jackson, 1997)."

Jackson, Julia A., editor, 1997, Glossary of geology: American Geological Institute, Washington, D.C., 769 p.

2188 Draft — 4 and 5 — **14211**

Comment Text

Page 4-5, Section 4.2 - the "Surface Water Mass Loading" section contains the same concerns raised by Hecla in comments on both Ninemile Creek and Canyon Creek. These concerns include: 1) overestimates of discharge, thus loads, due to development of a conservative synthetic hydrograph, 2) failure to provide accurate comparison of "estimated/expected" loads vs. actual monitoring results for same flow conditions (Tables 5 2-1 to 5.2-8), 3) failure to identify high flow sampling events occurring on either the ascending or descending limbs of the hydrograph (i.e. sample results at 100 cfs on ascending limb vs. 100 cfs on descending limb are not the same), 4) failure to identify all sources in a reach, and not just mining areas, and 5) failure to consider groundwater/ surface water interactions during high flow periods.

Response Text

Variability is incorporated into the model. Coefficients of variation have been included in this draft of the RI. Data on ascending and descending limbs of the hydrograph are taken into account in the model. Reviewer will need to read and comment on the Technical Memorandum explaining the probabilistic model.

Graphs are presented with predicted and measured values at different discharges.

2189 Draft — 4.2.2 — **14212**

Comment Text

Pages 4-5 through 4-7, Section 4.2 2 - sampling events from both "low flow events" (Oct. 1991 and Nov. 97 & 98) and "high flow events" (May 1991 & 1998) were "selected and mapped". The discussions seem to compare results from different years. It should be pointed out that the three low flow events had discharges at sample location SF 228 ranging from 25.2 to 73.7 cfs. The two high flow events had measured flows at SF 228 of 391.6 and 859 cfs. The draft RI narrative then attributes increased loads in the system solely to mining "sources". We have commented on the erroneous nature of this approach above.

The first point to be made is that you cannot compare loads at "low flow" or "high flow" at different times without addressing actual flows, samples taken during ascending or descending limb of the hydrograph, or even the time interval since the last high flow event (to account for any "flushing" effect on the floodplain materials).

Response Text

In section 4.2, increases in loading attributed to particular stream reaches are identified by comparing sampling results between locations sampled during the same event, not across sampling events, precisely to remove the problem with comparing results between years and high/low flow events.

Non-mining related sources of metals contribute to the background concentrations of metals observed in soil, sediment, and surface water. By using the background concentrations in conjunction with risk-based screening levels, locations with background concentrations of metals or less are screened out from further evaluation in the RI/FS process.

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Second, the increased load at increased flows (as already admitted in the draft RI) must specifically address the increased load attributable to floodplain materials rather than falsely attributing all load increases to all mining sources in a segment regardless of the physical location of the mining source. Increased loads with increased flows occur even in the mainstem of the Coeur d'Alene River where the only source (other than stormwater runoff and natural loads) is the floodplain materials.

Third, the zinc loads from permitted discharges must be separated from those loads due to other sources.

2190 Draft — 4.2.2.1 — **14213**

Comment Text

Pages 4-6 & 4-7, Sections 4.2 2.1 & 4.2 2.2 - it is not necessary to separate "Gold Hunter No. 6" from the Lucky Friday complex, as explained in comment # 19 (209) above.

Response Text

The source areas presented in the RI rely on the BLM source area list and GIS coverage. Though the Lucky Friday complex and the Morning No. 6 are adjacent, they had historically different operators/history and are therefore kept separate in this evaluation.

2191 Draft — 4 — **14214**

Comment Text

Page 4-7, last paragraph - the brief groundwater discussion only mentions potential loss of surface water to groundwater and not groundwater gains/interactions with surface water. Given the elevation loss in this segment, construction of I-90 on/with historic mine materials, and numerous drainages to the South Fork separated by I-90, groundwater to surface water loadings must be given more serious consideration as a "source" even though the Upper South Fork does not represent a realistic "problem".

Response Text

Groundwater/surface water interactions are presented in Section 2.2.4. A detailed study of specific losing and gaining reaches has not been performed.

2192 Draft — 4 — **14215**

Comment Text

Figures 4.1-4 through 4 1-7 incorrectly identify the location of the West Star Mine on Grouse Gulch.

Response Text

The location of the West Star Mine on Grouse Gulch is based on the base GIS coverage provided by the BLM. Since the commentor did not provide additional details on the correct location of this Mine, no changes made to the figures.

2193 Draft — 4 — **14216**

Comment Text

Figure 4.1-7 - what is the basis for presuming "POTENTIAL TAILINGS PRESENT" on top of the mine waste dump? We do not believe tailings are present here; no evidence of tailings at this location has been found.

Response Text

Reference deleted from figure.

2194 Draft — 5 — **14217**

Comment Text

Section 5, beginning on page 5-1 - the fate and transport probabilistic model is discussed in this section. While the Upper South Fork would be considered the most "stable" unit in the South Fork drainage, due to virtually no remedial activities (i.e. no real problem above Wallace on the South Fork), inputs to the model are too variable to develop a realistic model.

For example, the "discharge" above Wallace is estimated but there is no discussion on the accuracy of the discharge estimates. Admitted overestimates of discharge for Ninemile Creek is at least 45% at higher flows, and this is even after a correction factor to reduce the percent error! Since flow is integral to load estimates, a discussion of just how accurate the discharge estimates are must be discussed. The "average discharge rate" that is "expected" at SF228 is "approximately 115 cfs". This "average" value does not appear to be exceeded for the majority of the year so how does the use of an "average" daily value overestimate true daily loads in the model?

Response Text

Variability is incorporated into the model. Coefficients of variation have been included in this draft of the RI. Data on ascending and descending limbs of the hydrograph are taken into account in the model. Reviewer will need to read and comment on the Technical Memorandum explaining the probabilistic model.

As explained in response to one of the reviewer's previous comments, graphs are presented with predicted and measured values at different discharges.

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In addition, the "natural" variability at a given sample location is not limited to variability in sample collection and analysis. Concentrations will vary at the same flow rate, as well as different flow rates, and will also vary at the same flow rate depending on whether a sample was taken on the ascending or descending limb of the hydrograph of storm events.

A model is only as good as the inputs and what the draft RI needs is a graph clearly showing what the model predicts at a given location at a given flow rate vs. what an actual monitoring event at that same flow regime shows in reality. How can a model be used to direct remediation efforts if both the model is wrong and all sources are not fairly evaluated?